

**OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION**

MEMORANDUM

July 16, 2012

TO: Phillip Fielder, P.E., Permits and Engineering Group Manager

THROUGH: Kendal Stegmann, Senior Environmental Manager

THROUGH: Phil Martin, P.E., Existing Source Permits Section Manager

THROUGH: Peer Review, Herb Neumann, ROAT

FROM: David Pollard, ROAT

SUBJECT: Evaluation of Permit Application No. **2008-100-C (M-1) (PSD)**
Pryor Chemical Company
Pryor Mid-America Industrial Park (Lat. 36.242761°; Long. - 95.278481°)
Directions: From Highways 412 and 412B, go approximately 5 miles
north on 412B to main plant entrance.

SECTION I. INTRODUCTION

Pryor Chemical Company (PCC or applicant) submitted an application dated May 9, 2011 to Air Quality Division (AQD) to make numerous modifications to the permit for their synthetic fertilizer manufacturing plant (SIC 2873). Among those changes, a burner replacement triggered the requirements for PSD (Prevention of Significant Deterioration) analysis and a construction modification permit. Changes to accommodate emissions calculations and applicable regulations are also made. Not included in the list of modifications below, is a correction of the name from "Pryor Plant Chemical Company" to "Pryor Chemical Company" as well as minor changes made as a result of DEQ's review of the comments submitted.

In support of increasing permit limits and the BACT limit for the Ammonia Plant #4 Primary Reformer, the applicant submitted modeling and a proposed procedure to conduct a post-operation BACT analysis for the Primary Reformer. Emissions increases for other emissions units are accomplished below the significance levels of the applicable regulated pollutant(s). Certain increases in emissions are the result of increasing the permitted throughput limit for Ammonia Plant #4 from 700 tons per day to 770 tons per day, while others are post startup corrections. Ammonia Plant #4 was permitted at 770 tons per day throughput in previous permits and the applicant believes that is the actual design capacity of that process. The applicant submits these as corrections that do not involve a physical change or a significant emissions increase but has nevertheless included these emission increases in the modeling. The applicant submits that no additional PSD analysis for these post-startup revisions is required and submitted supportive documentation on May 3, 2011.

Summary of Requested Changes to Permit

Specific Condition 1.A.

- 1) Increase the permitted throughput limits of the Ammonia Plant #4 from 700 tons per day (TPD) to 770 TPD.
- 2) Establish a 1-year trial BACT limit on NO_x emissions from Ammonia Plant #4 Primary Reformer of 0.12 lbs-NO_x/MMBtu to be effective during a 1-year trial BACT review period. The equivalent NAAQS limit of 27.0 lbs-NO_x/hr has been modeled and was found to be in compliance with the NAAQS. This modification is discussed in more detail below, immediately following this summary of changes. The PSD analysis is included in Section VI.
- 3) Correct the SO₂ emissions limit for the Primary reformer to reflect the maximum hourly emissions rate achieved when burning waste gas from the Desulfurization Unit and also correct the annual, limit to reflect burning waste gas. Correct the same emissions calculations in the memorandum.

Specific Condition 1.B.

- 4) Replace the condensate throughput limit with stack gas design flow rate. This was necessary due to the difficulty in measuring mass flow rates of two-phase flow. Increase emissions limits for ammonia from the Condensate Steam Flash Drum. Initial performance testing documented higher emissions rates than originally permitted. No modifications were made that would have caused the higher rate.
- 5) Increase the hourly/annual emissions limits for ammonia from the Condensate Steam Flash Drum to 5.4 lbs/hr and 23.7 TPY to accommodate the increase in ammonia production.
- 6) Increase the hourly/annual emissions limits for VOC from the Condensate Steam Flash Drum to 10.4 lbs/hr and 45.6 TPY to accommodate the increase in ammonia production.
- 7) Increase the hourly emissions limits for methanol from the Condensate Steam Flash Drum to 3.86 lbs/hr to accommodate the increase in ammonia production. PCC will retain the annual limit of 9.5 ton/yr to maintain its minor source status for HAPs, to avoid PSD requirements.

Specific Condition No. 1.C.

- 8) Revise the discussion and references to the Nitric Acid Plants to account for increases in hourly production rates to 10.0 tons/hr for Nitric Acid Plant #1, 7.5 tons/hr for Nitric Acid Plant #3, and 16.7 tons/hr for Nitric Acid Plant #4. Nitric acid plant production limits have been removed as a limit considering that the plants have CEMS (continuous emissions monitoring).
- 9) Add hourly and annual CO emissions limits for Nitric Acid Plant #1 and Nitric Acid Plant #3 to account for fuel combustion at fumeabators.
Nitric Acid Plant #1 – 4.0 lbs/hr; 14.6 tons/yr
Nitric Acid Plant #3 – 3.0 lbs/hr; 11.0 tons/yr
These two nitric acid plants utilize extended adsorption design technology to reduce NO_x emissions prior to further treatment in the fumeabators. CO emissions result from the introduction of fuel gas (i.e., natural gas and purge gas from Ammonia Plant #4) and its associated combustion in the fumeabators on Nitric Acid Plants #1 and #3. A PSD analysis is included in Section VI of this memorandum.

- 10) Remove nitric acid throughput as a means of demonstrating compliance and retain continuous emissions monitoring systems. Same change in Specific Condition No. 7.

Specific Condition No. 1.D.

- 11) Decrease the PM₁₀ emission limit for each Nitric Acid Plant Preheater from 0.15 to 0.11 lbs/hr.

Specific Condition No. 1.E.

- 12) Add an alternate scenario to vent from Ammonia Plant #1 Regenerator Tower, adding vents 501b and 501c as follows:
“Carbon monoxide emissions from the Carbon Monoxide Vents (EU IDs 501a, 501b, and 501c shall not exceed the limits specified in the following table.”
- 13) Revise the compliance demonstration to include the above.
- 14) Increase hourly and annual emissions to accommodate the above changes.

Specific Condition No. 1.G.

- 15) Rename table “EU ID 601, 602 – Ammonium Nitrate Plant #1 Neutralizer Vent and Ammonia Nitrate Plant Run Down Tank Vent” as follows “EU ID 601 and 602 – Ammonium Nitrate Plants #1 and #2 Neutralizer Vents”.
- 16) Increase ammonia limits for Ammonium Nitrate Plant #1 and Ammonium Nitrate Plant #2 to 2.4 lbs- NH₃/hr and 0.6 tons- NH₃ /yr.
- 17) Delete PM₁₀ limit and combine with PM as a total and lower the hourly limit for the new total limit from 2.1 to 1.2 lbs-PM-PM₁₀/hr.

Specific Condition No. 1.J.

- 18) Reduce permit limits (all pollutants) for Boiler #1 to reflect actual heat input rating of 53.0 MMBtu/hr.

Specific Condition No. 1.Q.

- 19) Clarify that fugitive emissions are plant-wide.
- 20) Revise component counts and increase emissions.

Specific Condition No. 2.

- 21) Add “process off-gas” (e.g., purge gas) to the fuels allowed in the Primary Reformer.

Specific Condition No. 5

- 22) Include applicability of the new gasoline storage tank MACT.

Specific Condition No. 6.A.

- 23) Revise compliance monitoring for Condensate Steam Flash Drum to be consistent with alternative test method approved by DEQ for the initial compliance test.

Specific Condition No. 7

- 24) Remove nitric acid throughput as a means of demonstrating compliance and retain continuous emissions monitoring systems.

Specific Condition No. 9.

25) Revise performance test method for Condensate Steam Flash Drum to be consistent with the alternative test method approved by the DEQ for the initial compliance test.

VOC – EPA Methods 1-4, 624

Methanol – EPA Methods 1-4, GC/FID GC120P030.M

Specific Condition No. 10.a

26) Revise the list of Insignificant Activities to include the following:

Atmospheric Storage Tanks (Urea Plant feedstock)

Ammonia Recovery Tanks (2)

Ammonium Nitrate Plant #1 Rundown Tank Vent

Ammonium Nitrate Plant #2 Rundown Tank Vent

Urea Plant #2 ART Tank Vent

Specific Condition No. 10.b

27) Revise the list of Insignificant Activities to include the following:

Granular ammonium nitrate storage, handling, and loading/unloading operations

Ammonia truck and railcar loading

Ammonia Plant #4 fugitives

Nitric acid loading to trucks and railcars

Off-specification UAN and AN loading to trucks and railcars

Ammonia Plant #4 Purge Gas Scrubber Vent

Ammonia Plant #4 Desulfurization Unit - Carbon Regeneration Using Steam

Modification to Increase Limits on Primary Reformer

On February 19, 2009, Pryor Chemical Company was issued a Prevention Of Significant Deterioration (PSD) permit, Permit No. 2008-100-C (PSD), to place back into service, a synthetic fertilizer manufacturing plant that had been shut down for approximately ten years. The facility was previously operated by Wil-Gro Fertilizer, Inc. Based on information submitted by the current applicant, PCC, the facility appears to have originally been in operation in 1966. Rather than attempt to reconcile existing permits with changes that may result from re-starting a plant that had been inactive for ten years, a full PSD (prevention of significant deterioration) analysis was completed for the issuance of Permit No. 2008-100-C (PSD).

Following is the sequence of events, as provided by the applicant, leading to this application for a modification. In 2010, PCC replaced the existing burners of a process heater, hereinafter referred to as the Primary Reformer (in Ammonia Plant #4), resulting in an exceedance of the permitted PSD limits (BACT and NAAQS limits). The replacement was done to remedy poor performance of the existing burners that were apparently undersized as the burner vendor recommended replacement with larger burners. The current permit limits are based on the burner manufacturer's emissions guarantee of 0.053 lbs-NO_x/MMBtu. The manufacturer's emissions guarantee for the replacement burners is 0.059 lbs-NO_x/MMBtu, slightly higher than that for the original burners. PCC undertook an investigation to determine whether permit limits were being met. PCC determined from preliminary measurements using hand-held instrumentation that NO_x emissions could exceed the limits under certain operating scenarios

and conditions. Confirmation testing performed December 29, 2010 through January 11, 2011, indicated that NO_x emissions averaged 0.108 lbs-NO_x/MMBtu or approximately 17.22 lbs-NO_x/hr. The permit limits are 0.053 lbs-NO_x/MMBtu (BACT) and 11.93 lbs-NO_x/hr.

PCC believes that the manufacturer's guarantees are more representative of a boiler and cannot be met by a primary reformer at an ammonia plant. The gist of the explanation is that there are differences in operational conditions and fuels. In addition to natural gas, the primary reformer is fueled by waste gases from the desulfurization unit and purge gas from the ammonia plant. Ancillary to other potential causes, it is believed, and supported by certain technical publications submitted by applicant, that unrecovered ammonia in the purge gas burned in the reformer causes increases in NO_x emissions. As concluded by PCC, these emissions exceed the current limits.

PCC was required to perform a new PSD analysis and to submit an application for a permit modification. As part of a preliminary BACT analysis for the primary reformer, PCC performed a search of the RACT/BACT Clearinghouse and did not find a BACT limit established for primary reformers at ammonia plants, as was the situation for the analysis performed for Permit No. 2008-100-C (PSD). Because boilers are the closest resemblance to a primary reformer in operation and function, the new search resulted in only a few additional boilers. PCC was unable to find BACT specific to, or more representative of, primary reformers using search criteria applicable to boilers.

PCC is requesting a temporary BACT limit to allow for a post-operation BACT analysis for the Primary Reformer and then will submit an application to revise the permit limits. In the meantime, for this permit, PCC has proposed a one-year trial limit of 0.12 lbs-NO_x/MMBtu for BACT and an hourly permit limit of 27.0 lbs-NO_x/hr to be effective while conducting various engineering studies of the controls and operating procedures of the ammonia plant and primary reformer, and of the burner, to determine economically feasible means of minimizing NO_x emissions while conducting emissions testing to support the conclusions of the studies. The results of air dispersion modeling to demonstrate compliance with the NAAQS limit are included in this memorandum under the section detailing modeling. At the end of the one-year trial limit period, PCC will submit an application to permit the final NO_x limits. AQD has revised the applicant's proposed trial BACT analysis to include evaluation of add-on controls used in other industry applications to control NO_x emissions.

SECTION II. EQUIPMENT

The facility consists of a complex network of process vessels, dryers, and piping. The following table categorizes the processes at the facility by emission unit group (EUG) and emission point identification.

EMISSION UNITS			
EU/EUG ID	Point ID	EU Name/Model	Construction Date
EUG 1		Ammonia Plant #4	
1	101	225 MMBTUH Ammonia Plant #4 Primary Reformer	1995
1	102	Ammonia Plant #4 Condensate Steam Flash Drum	1995
EUG 2		Urea Plant #2	
2	201	Urea Plant #2	1995 ¹
EUG 3		Nitric Acid Plants	
3	301	Nitric Acid Plant #1 - Fumeabator Unit	1966
3	302	Nitric Acid Plant #3 - Fumeabator Unit	1966
3	303	Nitric Acid Plant #4 - SCR Unit	2008 ²
EUG 4		Nitric Acid Preheaters	
4	401	20 MMBTUH Nitric Acid Preheater #1	1966
4	402	20 MMBTUH Nitric Acid Preheater #3	1966
4	403	20 MMBTUH Nitric Acid Preheater #4	1964
EUG 5		Carbon Dioxide Vent	
5	501	Carbon Dioxide Vent	1966
EUG 6		Ammonium Nitrate Plants	
6	601	Ammonium Nitrate Plant #1 Neutralizer Vent	1966 ³
6	602	Ammonium Nitrate Plant #2 Neutralizer Vent	1995 ³
EUG 7		Granulator Scrubbers	
7	701	Granulator Scrubber #1	1975
7	702	Granulator Scrubber #2	1975
7	703	Granulator Scrubber #3	1975
EUG 8		Boilers	
8	801	53 MMBTUH Boiler #1	1978
8	802	80 MMBTUH Boiler #2	1995
EUG 9		Cooling Towers	
9	901	Cooling Tower #1	1966
9	902	Cooling Tower #2	1995
EUG 10	NA	Fugitives	Various
NA	NA	Insignificant Emissions Sources	Various
NA	1001	0.0152 MMBTUH Ammonia Storage Flare Pilot	1996
NA	1002	1,000-gallon Gasoline Storage Tank	1965
NA	NA	Storage Tanks	Various

NA - Not Applicable.

- 1 Urea Plant #2 was originally constructed in California in 1965 and relocated to the Pryor Chemical Company in 1995.
- 2 Nitric Acid Plant #4 was originally constructed in Illinois in 1964 and relocated to the Pryor Chemical Company in 1995. The SCR was new construction added during 2008-2009.
- 3 The ammonium nitrate plants are designed to be closed systems, i.e., only fugitive emissions are expected.

SECTION III. PROCESS DESCRIPTION

Pryor Chemical Company (Pryor) is an integrated inorganic fertilizer plant located at the Mid-America Industrial District in Pryor, Oklahoma. The facility consists of several production plants as described below.

EUG No. 1 - Ammonia Plant #4

Ammonia Plant #4 operates at a maximum capacity rate of 770 tons of ammonia per day, or 281,050 tons per year. The plant is equipped with a gas-fired primary reformer with a maximum heat input capacity of 225 MMBtu/hr. The reformer is fired on a combination of pipeline quality natural gas, waste gas generated from the Natural Gas Desulfurization Unit, and process offgas (e.g., purge gas). According to the applicant, a purge gas analysis off the flow outlet of the scrubber on June 13, 2010 yielded: Hydrogen 67.87%, Nitrogen = 21.55%, Argon 5.77%, and Methane 5.12%. Water content is considered to be less than 100ppm. Methane and argon content vary between 5.0 and 7.0 %, which changes Hydrogen and nitrogen contents accordingly.

The plant produces ammonia by reacting hydrogen with nitrogen over a catalyst at high temperature and pressure to form ammonia (NH₃). Nitrogen is obtained from ambient air, while hydrogen is obtained from the catalytic steam reforming of methane. The process uses about 21,250 standard cubic feet of natural gas per ton of ammonia produced. There are six steps required to produce ammonia using the catalytic steam reforming method:

- Natural gas desulfurization
- Catalytic steam reforming
- Carbon monoxide shift
- Carbon dioxide removal
- Methanation
- Ammonia synthesis ($3\text{H}_2 + \text{N}_2 \rightarrow 2\text{NH}_3$)

Natural Gas Desulfurization

Sulfur is a poison to many catalysts used in the ammonia synthesis process. In this step of the ammonia synthesis process, the sulfur contained in the natural gas feedstock is removed with activated carbon.

Catalytic Steam Reforming

After desulfurization, the natural gas feed is mixed with the steam and the mixture is sent to the primary reformer. This process utilizes indirect heating fired on a combination of pipeline quality natural gas, waste gas generated from the Natural Gas Desulfurization Unit, and process offgas (e.g., purge gas). In the reforming process, approximately 56% of the methane contained in the natural gas feed is converted to hydrogen and carbon dioxide. The resulting gas mixture is then sent to a secondary reformer, where it is mixed with compressed air to form a final "synthesis gas" that has the desired hydrogen to nitrogen molar ratio. This is an exothermic reaction that does not need an external source of heat. The synthesis gas leaving the reformer is cooled, and the heat recovered, in the Feed Gas Preheater.

Carbon Monoxide Shift

Carbon monoxide is formed as a byproduct in the catalytic steam reforming process. After cooling, the carbon monoxide and water contained in the synthesis gas are converted to carbon dioxide and hydrogen in the High Temperature Shift Converter. Un-reacted steam is condensed and separated from the synthesis gas in a knockout drum, and the condensate is flashed in Ammonia Plant #4 Condensate Steam Flash Drum (EU ID 102) at a rate of approximately 1,050 lbs/hr to remove volatile gases. The residual condensate is returned to the boiler or may be temporarily held in the de-aerator until ready for use as feed water to the boiler.

Carbon Dioxide Removal

After the carbon monoxide shift, the carbon dioxide is removed from the process gas by sending the synthesis gas through an absorption tower. There, the carbon dioxide is stripped out of the gas using methyl diethanolamine (MDEA). Carbon dioxide is removed from the MDEA in a stripper column, where it is then routed as needed to the Carbon Dioxide Plant and the Urea Plant, and excess amounts are vented.

Methanation

The synthesis gas leaving the carbon dioxide absorber consists primarily of uncombined hydrogen and nitrogen, with residual amounts of carbon dioxide and carbon monoxide. Carbon dioxide and carbon monoxide are poisons to ammonia synthesis catalysts and must be removed. This is accomplished by passing the heated process gas over a catalyst, where the carbon dioxide and carbon monoxide are converted to methane.

Ammonia Synthesis

In this final step, the hydrogen and nitrogen-rich synthesis gas is converted to ammonia. The process is not 100% efficient, and some of the unconverted synthesis gas leaving this step in the process is mixed with incoming raw synthesis gas and recycled back through the process.

Synthesis gas from the methanation process is compressed, mixed with recycled synthesis gas, and then cooled. Any ammonia in the synthesis gas, which has condensed at this point in the process, is separated from the unconverted synthesis gas and sent to the separator. The unconverted synthesis gas is compressed, preheated, and then contacted with an iron oxide catalyst in the synthesis converter. Ammonia in the gas leaving the converter is condensed, and the ammonia is sent to a separator. Ammonia sent to the separator is flashed to remove impurities. The ammonia rich flashed vapor is then condensed in a chiller, where anhydrous ammonia is removed and stored as a liquid at low temperature.

EUG No. 2 - Urea Plant

Pryor operates one urea production plant with a maximum production capacity of 480 tons of urea per day, or 175,200 tons per year. Urea ($\text{CO}(\text{NH}_2)_2$) is produced by combining ammonia (NH_3) with carbon dioxide (CO_2). The ammonia and carbon dioxide used in this process are produced on-site.

In the first step in the urea manufacturing process, ammonia and carbon dioxide are combined to form ammonium carbamate ($\text{NH}_2\text{CO}_2\text{NH}_4$). The ammonium carbamate is then partially dehydrated to form an aqueous urea solution. All of the urea produced by the facility is mixed

with ammonium nitrate in the Urea-Ammonium Nitrate Solution Plant to form urea-ammonium nitrate (UAN) solution. The UAN solution is stored on-site temporarily prior to being shipped off-site. This portion of the process is a closed system; therefore, there are no emissions released to the atmosphere. Additionally, no urea granulation occurs at this facility.

EUG No. 3 - Nitric Acid Plants

Pryor operates three nitric acid plants at the facility. Nitric Acid Plant #1 produces a maximum of 240 tons of 100% nitric acid per day, or 73,000 tons per year; Nitric Acid Plant #3 produces a maximum of 180 tons of 100% nitric acid per day, or 54,750 tons per year; and Nitric Acid Plant #4 produces a maximum of 400 tons of 100% nitric acid per day, or 127,750 tons per year. Nitric acid (HNO_3) is produced in three steps:

- Ammonia oxidation
- Condensation
- Absorption

Ammonia Oxidation

In this process, ammonia is first mixed with ambient air, heated, and passed over a cobalt catalyst, where the ammonia is oxidized to nitric oxide.

Condensation

The nitric acid rich gas stream is first cooled in a waste heat recovery boiler and then further cooled in a cooler/condenser. Under these conditions, the nitric oxide formed during the ammonia oxidation step is further oxidized to nitrogen dioxide and nitrogen tetroxide.

Absorption

The nitrogen dioxide and nitrogen tetroxide mixture from the condensation step is sent to the bottom of an absorption tower, where it flows countercurrent to water introduced at the top of the tower. Nitric acid is formed by contact of the nitrogen dioxide and tetroxide with a water scrubber and is removed at the bottom of the absorption tower.

EUG No. 4 - Nitric Acid Plant Preheaters

The Nitric Acid Plant Preheaters are used to preheat the process air from 300 °F to 500 °F for startup purposes. The process air flows through tubes inside the preheater, which are heated by a natural gas fired burner. The preheaters are used for startup purposes only. As implied by the EUG name, these emissions units have only combustion related emissions.

EUG No. 5 – Carbon Dioxide Vent

Excess carbon dioxide from the processes is vented through the Carbon Dioxide Vent. Refer to sections describing the Carbon Monoxide Shift, Carbon Dioxide Removal, and Carbon Dioxide Regenerator processes. Carbon dioxide is not a regulated pollutant at this time, but the waste CO_2 contains trace amounts of carbon monoxide.

EUG No. 6 - Ammonium Nitrate Plants

Pryor operates two ammonium nitrate plants at the facility. The ammonium nitrate plants have a maximum total combined production capacity of 1,140 tons of ammonium nitrate per day (570 tons per day or 208,050 tons per year each). Ammonium nitrate (NH_4NO_3) is produced by the neutralization of nitric acid with ammonia. Both the ammonia and the nitric acid are produced on-site. The resulting aqueous ammonium nitrate solution is either concentrated by evaporation and sent to the granulator to be processed into granules, or mixed with urea to form urea ammonium nitrate solution.

Ammonium Nitrate Plant #1 and Ammonium Nitrate Plant #2

Ammonia vapors and 56% Nitric Acid liquid are mixed in a neutralizer (tank) at atmospheric pressure. This process is exothermic, and therefore makes steam at atmospheric pressure due to boiling the water out of the nitric acid. As the level in the neutralizer comes up, it reaches an overflow line that sends the 83% ammonium nitrate solution to the rundown tank still at atmospheric pressure. At this point, the ammonium nitrate solution is approximately 280 °F. Steam that is produced in the neutralizer and the rundown tank is utilized to heat the nitric acid and vaporize ammonia. Steam that is not condensed as a result of this heat transfer is subsequently condensed in a water cooled condenser.

EUG No. 7 - Granulator Scrubbers

Granulated ammonium nitrate can be produced using the Pan Granulator or the Prill Tower. Ammonium nitrate granules are produced at the Pan Granulator by spraying concentrated ammonium nitrate solution onto a heated, rotating circular pan. Layers of ammonium nitrate are added to the pan as the water evaporates, eventually forming granules. The granules are then cooled, screened to obtain consistent granule sizes, and then stored temporarily prior to being shipped offsite. There are three separate scrubbers serving the Granulator Plant and the Prill Tower. They perform the same function of scrubbing ammonium nitrate dust particles from separate air flows on three different portions of the Granulator Plant. When the Pan Granulator is running, all three of the scrubbers are in service. When the Prill Tower is running, Granulator Scrubber #1 is the only one in service. The liquid sumps of the three scrubbers each contain a weak ammonium nitrate solution and are connected to make one single liquid circulation. Granulator Scrubber #1 receives condensate from the ammonia nitrate condensate tank, and the liquid concentrates up to a maximum of 3% as a result of control of ammonium nitrate PM. The scrubber liquid then gravity feeds to Granulator Scrubber #2, where it concentrates up to a maximum of 17%. The liquid is then pumped to Granulator Scrubber #3, where it concentrates up to a maximum of 60%. Finally, the scrubber liquid is pumped back into the ammonium nitrate product solution and reused. Following are additional details concerning each scrubber.

Granulator Scrubber #1: A cyclone blower pulls air across a set of chiller coils and through the product cooler counter current to the flow of ammonium nitrate granules flowing through the cooler. This process cools the nitrate down by a temperature difference of approximately 70 degrees Fahrenheit (°F) from the inlet of the cooler to the exit of the cooler. A small amount of ammonium nitrate particulate is pulled out of the cooler and into the top of the cyclones, where it is forced to the outside of the cyclones by centrifugal force created by the cyclonic action of the

forced air. The particles are washed down into the sump (wet system tank) by two nozzles spraying a weak ammonium nitrate solution (1% - 3%) through the cyclones. The air exits the system via the blower discharge stack. The weak ammonium nitrate solution level in the Granulator Scrubber #1 sump runs into an overflow line that feeds Granulator Scrubber #2 Scrubber to maintain the working level in it. The concentration of the ammonium nitrate solution in Granulator Scrubber #1 is controlled by how much condensate is added from the condensate tank in the Ammonium Nitrate Solution Plant, and as noted, is maintained at approximately 1% to 3%. The two nozzles at the top of the cyclone are checked once per shift and are changed out if necessary. The wet system tank is washed out approximately once per month during shutdown for maintenance repairs.

Granulator Scrubber #2 (the Grey Scrubber), on the Pan Granulator only, pulls emissions from two discharges. The scrubber pulls steam and small ammonium nitrate particles off the top of the evaporator and ammonium nitrate dust out of the pan disc. These two streams combine to flow past four nozzles spraying ammonium nitrate solution (13% - 17%) supplied by a recycle pump. The combined stream flows through a venturi, where the liquid ammonium nitrate solution is separated from the gas. The particle-laden liquid collects in the sump (collection tank), and the gas is discharged to the atmosphere. The sump liquid level is automatically controlled to pump excess liquid to Granulator Scrubber #3. The concentration of the liquid in Granulator Scrubber #2 is determined by how much liquid it receives from Granulator Scrubber #1, but the concentration is usually 13% to 17% (with occasional variances outside that range). This system requires very little maintenance; however, the man-way is opened annually, and the inside of the scrubber is inspected. Past maintenance required that the nozzles be replaced one to two times per year. The collection tank is washed out about once per month when the unit is shut down for maintenance repairs.

Granulator Scrubber #3: A blower pulls air across a set of chiller coils and through the pre-cooler countercurrent to the flow of ammonium nitrate granules also flowing through the pre-cooler. This cools the ammonium nitrate by a temperature drop of approximately 50 °F from the inlet of the cooler to the exit of the cooler. Ammonium nitrate fines and dust are pulled out of the pre-cooler and into the north vessel of the scrubber, where the emissions-laden air comes into contact with the ammonium nitrate solution having (approximately 60% by concentration) that is being sprayed through four nozzles. The air flows from the north vessel of the scrubber to the south vessel and through four sets of hog hair filters that are sprayed with ammonium nitrate solution to keep the recovered fines washed to the scrubber sump. The concentration of the solution is held at 58% to 60%. At 65% concentration, the solution has a tendency to precipitate out on the filters, thereby plugging them and causing damage. The discharge air then passes through a set of baffles and then through a demister pad designed to remove entrained liquid and mist before it is discharged to the atmosphere. The level of the scrubber sump is monitored manually through a sight glass, and excess liquid is recycled back to the ammonium nitrate granulator. Scrubber #3 is inspected, cleaned out, and filters and nozzles are replaced as needed whenever the granulator is shut down for maintenance. Maintenance activities are performed approximately once per month.

EUG No. 8 - Steam Generation Boilers

PCC operates two natural gas fired boilers at this facility. Boiler #1 has a maximum heat input rate of 53 MMBtu/hr. Boiler #2 has a maximum heat input rate of 80 MMBtu/hr. The boilers provide the steam needed to operate the various pieces of equipment at the facility.

EUG No. 10 – Gasoline Storage Tank

PCC has a 1,000-gallon gasoline storage tank that was installed in 1965. The tank is subject to 40 CFR Part 63, Subpart CCCCCC, National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities.

Out of Service Equipment

Ammonia Plant #1 (Reformer, Desulfurization, etc.)

Ammonia Plant #2 (Reformer, Desulfurization, etc.)

Ammonia Plant #3 (Reformer, Desulfurization, etc.)

Urea Plant #1

Nitric Acid Plant #2

SECTION IV. EMISSIONS

Except for the primary reformer in Ammonia Plant #4 and the Condensate Steam Flash Drum, emissions calculation methods are carried forward from the existing permit. Emissions are based on the anticipated maximum production rates. Various minor increases in emissions are the result of the increased production capacity of Ammonia Plant #4. Changes are explained in the applicable section. Permit limits are based on these calculations and are justified through PSD analysis, including BACT analysis and modeling to document compliance with the NAAQS.

EUG No. 1 - Ammonia Plant #4

The maximum ammonia production capacity of Ammonia Plant #4 is currently permitted at 700 tons per day (TPD). As noted in the Introduction, the requested permitted throughput rate for this modification is 770 tons per day. Ammonia Plant #4 has operated in the past at 770 TPD under previous owners and with the new burners installed in the primary reformer, it is believed that it can achieve 770 TPD again. Emissions generated at the ammonia plant primarily include emissions of combustion from the Primary Reformer (EU ID 101) and emissions of volatile organic compounds (VOC) generated from the Condensate Steam Flash Drum (EU ID 102).

Primary Reformer

The maximum heat input rating of the reformer is 225 MMBtu/hour. Operating 8,760 hours annually equates to a fuel demand of 1,971,000 MMBtu/year. Except for emissions of SO₂, and NO_x, calculations for combustion emissions in the existing permit were based on AP-42 emission factors and the fuel demand of 1,971,000 MMBtu/year, which equates to a natural gas fuel input of 1,932.4 MMscf/year based on a gross calorific value of 1,020 Btu/scf and annual operating hours

of 8,760. Actual emissions were treated the same as potential to emit (PTE). NO_x emissions were based on the burner manufacturer's guarantee of 0.053 lbs-NO_x/MMBtu. However, as noted in the introduction, this was increased to 0.059 lbs-NO_x/MMBtu when PCC changed out the burners. PCC discovered that even that limit cannot be met and is requesting a trial BACT limit of 0.12 lbs-NO_x/MMBtu.

SO₂ emissions result from the combustion of a mixture of two fuel sources, namely pipeline natural gas and waste gas from the desulfurization unit. The ammonia process uses approximately 21,250 standard cubic feet of natural gas per ton of ammonia produced. For an ammonia production rate of 770 TPD, this equates to 5,972 MMscf/yr. The facility estimates, based on data from past operations, that fuel sulfur content of the fuel gas mixture to the primary reformer can be as high as 20 grains/100 scf when the desulfurization unit is in operation. This would include some natural gas as there has not been enough waste gas to run the primary reformer at desired capacity. From this (20 grains/100 scf), the maximum hourly rate of SO₂ emissions is calculated to be 12.6 lbs/hr. The annual limit is the sum of the primary fuel emissions and the waste gas fuel emissions (0.69 + 2.13 = 2.82, rounded to 2.9 TPY) assuming 100% conversion of sulfur to SO₂.

Pollutant	Emission Factor		Source of Emission factor	Emissions	
	Value	Units		Max. (lb/hr)	Annual (ton/yr)
CO	84.0	lbs-CO/MMscf	AP-42; Table 1.4-1	18.53	81.16
NO _x	0.12	lbs-NO _x /MMBtu	One-Year Trial BACT Limit	27.0	118.26
PM	7.6	lbs-PM/MMscf	AP-42; Table 1.4-2	1.68	7.34
PM ₁₀	5.7	lbs-PM ₁₀ /MMscf	AP-42; Table 1.4-2	1.26	5.51
SO ₂ primary fuel	0.25	gr-sulfur/100 scf (avg)	Supplier Data	NA ¹	0.69
SO ₂ waste gas	20.0	gr-sulfur/100 scf (max)	Site Specific Test Data (Hourly) Supplier Data (Annual)	12.60 ¹	2.13 ²
VOC	5.5	lbs-VOC/MMscf	AP-42; Table 1.4-2	1.21	5.31
Formaldehyde	0.075	lbs-Form./MMscf	AP-42; Table 1.4-3	0.02	0.07

1 Hourly limit is based on worst case when burning waste gas and natural gas from desulfurization unit.

2 Annual limit is 2.9, the sum of the primary fuel emissions and the waste gas fuel emissions.

Condensate Steam Flash Drum

For Permit No. 2008-100-C (PSD), emissions of VOC and NH₃ from the condensate flash drum were taken from the memorandum for Permit No. 95-133-C (M-2). Those calculations of emissions were based on mass balance using known concentrations of the subject pollutants from past operations for ammonia when production rates were near 29.2 tons per hour, the condensate throughput rate, and continuous operation (8,760 hours per year). Actual emissions were treated the same as PTE. For VOC, it was and is assumed that all volatile organic compounds evaporate from the condensate. For ammonia, inlet and outlet concentrations of 340 ppmw and 330 ppmw from past operations indicated that 10 ppmw is lost as emissions to the atmosphere. It was assumed based on past operations that the condensate liquid density is near that of water (8.34 lbs/gal). Condensate throughput was then converted from hourly and annual volumetric rates to mass rates, as indicated in the following table.

As a comparison, AQD calculated emissions of VOC and NH₃ using AP-42, Table 8.1-1 emission factors of 1.2 lbs/ton for VOC and 2.2 lbs/ton for NH₃, yielding 153.5 TPY VOC and 281.4 TPY NH₃. Footnote “g” to Table 8.1-1 states that this is “Mostly methanol, which is classified as Non-Methane Organic Compound and a hazardous air pollutant”, but the validity of this assumption and the accuracy of the VOC emissions factor itself are questionable. For the purpose of establishing permit limits and to demonstrate potential emissions for Permit No. 2008-100-C (PSD), methanol limits were proposed using 1999 TOC sampling data and the worse-case assumption that 50% of the available TOC is released as methanol.

TOC Concentration in Inlet to Flash Drum 28 ppm TOC
 TOC Concentration in Exit from Flash Drum 32 ppm TOC

Converting TOC to methanol (CH₃OH):

Molecular weight of CH₃OH = 32
 Molecular weight of TOC (as carbon) = 12
 (32/12) x 32 ppm TOC = 85.33 ppm methanol

Calculating emissions in lb/hr, based on mass balance:

For condensate flow = 9,600 gal/hr and density = 8.34 lb/gal
 Then total mass flow = 80,064 lb/hr

and:

Methanol emitted = 80,064 lb/hr x 85.33/1,000,000 x 50% = 3.42 lb/hr

Potential to Emit = 3.42 lb/hr x 8,760/2,000 = 15.0 ton/yr

Existing Permit Limits

Pollutant	Emissions Factor	Condensate Throughput	Emissions	
	ppmw	lb/hr	lb/hr	ton/yr
VOC	115	80,064	9.21	40.33
Methanol	85.33	80,064	3.42	9.5
NH ₃	10	80,064	0.80	3.51

PCC requested to retain an enforceable permit limit of 9.5 ton/yr methanol from the existing permit to maintain its minor source status for HAPs, thus avoiding MACT requirements. To ensure compliance with this limit, in addition to initial stack test requirements, a plan for monitoring process conditions using parameters such as temperature, pressure, condensate throughput, and periodic measurement of methanol in the condensate is required. The referenced Monitoring Plan was submitted electronically to ODEQ in November 2010.

The following requested limits for this permit are based on the increased condensate throughput of 90,472 lbs/hr (10,848 gallons per hour) and post operation testing results for ammonia. Based

on this, the applicant requests that the limits be increased as follows, except to retain the enforceable annual limit on methanol of 9.5 tons per year. The requested limit for ammonia is based on a concentration in the condensate of 5,140 ppm_w. Based on this, the applicant requests that the limit be increased from 3.51 tons per year to 23.64 tons per year. This includes a 25% contingency.

Requested Permit Limits

Pollutant	Concentration	Condensate Throughput	Emissions	
	ppmw	lbs/hr	lbs/hr	tons/yr
VOC	115	90,472	10.4	45.6
Methanol	85.3	90,472	3.86	9.50
NH ₃	5,140	90,472	5.4	23.7

For continuing compliance demonstration in this permit, the condensate throughput limit will be replaced by the design maximum stack gas flow rate of 1,050 lbs/hr. To demonstrate compliance, PCC will measure methanol concentration and calculate the emission rate based using the maximum stack gas flow value, resulting in a conservative estimate of actual emissions. The stack gas flow rate will not be measured as it is assumed to be limited by the design output flow rate of 1,050 lbs/hr.

Pollutant	Stack Gas Discharge Rate	Emissions	
	lb/hr	Maximum (lb/hr)	Annual (ton/yr)
VOC	1,050	10.4	45.6
NH ₃		5.4	23.7
CH ₃ OH		3.86	9.5

For the initial performance test, steam samples were collected from the stack, condensed, and the analyses were performed using EPA Method 624 for VOC and GC/FID GC120P030.M for methanol, as approved by ODEQ for this source. The methods are listed in the draft permit in Specific Condition 10 of this permit.

Desulfurization Unit Regeneration

Desulfurization of natural gas used as a raw material in the process is done using carbon adsorption. Regeneration of the carbon is accomplished by flushing the carbon bed with natural gas heated to temperatures near 350 °F. Off-gases from the Desulfurization Unit Regeneration are routed to the reformer and combined with the natural gas fuel gas.

Carbon Dioxide Regenerator

Off-gases from the Carbon Dioxide Regenerator are routed back to the Carbon Dioxide Plant and the Urea Plant as needed, and excess amounts are vented.

EUG No. 2 – Urea Plant

The Urea Plant has a maximum capacity of 175,200 tons per year. All off-gases are recycled back into the process.

EUG No. 3 – Nitric Acid Plants

The memorandum of the existing permit states that maximum total combined production capacity of Nitric Acid Plants #1 (200 tons per day), #3 (150 tons per day), and #4 (350 tons per day) is 700 tons per day, and the requested permitted throughput is 700 tons per day. For this permit application, the applicant states that a review of process design concluded that the capacities are 240 tons per day (10 tons per hour), 180 tons per day (7.5 tons per hour), and 400 tons per day (16.7 tons per hour), respectively, for a total of 820 tons per day. Emissions of NO_x are generated as tail gas from the acid absorption towers from all three plants. NO_x is the end result of a three-step reaction. First, ammonia and air are heated and oxidized using a catalyst to form nitric oxide and water. Second, the nitric oxide reacts with residual oxygen under high pressure to form nitrogen dioxide. Finally, the nitrogen dioxide is sent through an absorption tower, where it reacts with water to form aqueous nitric acid (2HNO₃). Secondary air is introduced into the tower to re-oxidize NO (nitrogen II oxide) that is formed in the absorption process resulting in emissions of air and NO_x (NO₂ and NO). Tail gases exiting the top of the absorption towers on Plant #1 and Plant #3 pass through non-selective catalytic reduction (NSCR) units, referred to as fumeabators, prior to discharge to the atmosphere to control NO_x emissions. These two nitric acid plants utilize extended adsorption design technology to reduce NO_x emissions prior to further treatment in the fumeabators. CO emissions result from the introduction of natural gas and its associated combustion in the fumeabators on Nitric Acid Plants #1 and #3. A review of NSCR technical guidance performed by the applicant during preparation of the application for this permit indicated that CO emissions are present at NSCR control units. To calculate CO emissions, a site specific factor of 0.4 lb/ton 100% acid produced was used. This factor is based on site specific data from previous operations at the plant. The factor will be verified during the initial performance testing. The applicant submits the following from technical guidance:

“Non-Selective Catalytic Reduction (NSCR) involves partial combustion of a hydrocarbon fuel to first generate reaction heat followed by reaction of the hydrocarbon with NO_x to form elemental nitrogen and carbon dioxide. As in virtually all hydrocarbon combustion processes, some carbon monoxide (CO) is formed by incomplete combustion. High levels of NO_x reduction can be achieved by increasing the fuel concentration relative to the available oxygen. However, the CO concentration increases dramatically. To achieve NO_x reduction levels comparable to SCR, NSCR would result in CO emissions of 350 ppmv or greater. Consequently, even though NSCR may be able to achieve a similar degree of NO_x reduction to SCR, this collateral pollutant CO emission is an undesirable consequence not experienced in the use of SCR.”

Tail gas from Nitric Acid Plant #4 is controlled by a selective catalytic reduction (SCR) control system. Emissions of NO_x and NH₃ are exhausted to the atmosphere from the SCR. This is the new Nitric Acid Plant #4 SCR Unit that was constructed under Permit No. 2008-100-C PSD. According to a technical bulletin titled *“Platinum Catalysts And Systems For Pollution Control,*

by J. B. Hunter, Matthey Bishop, Inc.” included with PCC’s response to AQD’s Notice Of Deficiency issued October 2, 2008, the tail gas discharged from nitric acid plants is the main source of emissions from nitric acid plants. As shown in the emissions summary of this permit memorandum, it is the main source of NO_x emissions from this facility. In addition to NO, NO₂, and O₂, tail gas contains trace amounts of acid mist or vapor. According to the referenced bulletin, the total of NO and NO₂ may range from 0.1 to 0.6 percent by volume.

Nitric Acid Plant #1 has a fumeabator manufactured by Engelhard, which uses a platinum/rhodium/palladium catalyst and a Al₂O₃ substrate catalyst pack. The packs are 30” in diameter and 18” deep. Originally, the fumeabator had one pack in it, but in 1994, it was modified to hold two. The fumeabator now has one pack of Engelhard PR3 catalyst and one pack of Engelhard PR5 catalyst. Methane (natural gas) or purge gas is added to the tail gas upstream from the fumeabator. The gas mixture results in an exothermic reaction on the catalyst heating to temperatures around 980 °F near the inlet to the fumeabator and increasing to 1,400 °F near the outlet going into the gas cooler boiler. The gas mixture exits the boiler to the expander at temperatures near 1,100 °F. The gas passes through the expander, and is then exhausted out of the stack to the atmosphere. Nitric Acid Plant #3 uses a fumeabator manufactured by S & AT Company. It is designed much like the one used in Plant #1 and also employs a two-stage catalyst. However, the catalyst used in the Plant #3 fumeabator is a nickel/platinum/aluminum-oxide material.

Emissions of NO_x from Nitric Acid Plants #1 and #3 are based on an emission factor of 1.6 lbs/ton of nitric acid production considering the extended absorption process and NSCR control technology and are based on emissions testing conducted prior to the facility shutdown mentioned in Section I of this Memorandum. The accuracy of this factor and thus compliance with the emissions limit will be determined by stack testing. Once startup has occurred, an initial performance test will be performed at each plant pursuant to Specific Condition 10 of this permit. As previously noted, tail gas from Nitric Acid Plant #4 is treated in a SCR unit before discharge to the atmosphere. Emissions calculations for Plant #4 are based on the SCR manufacturer’s guarantee of 2.5 lbs/ton of nitric acid production. Emissions of NH₃ slip from the SCR result from an incomplete reaction of NH₃ and NO_x. Emissions of NH₃ are based on an emissions factor provided by the SCR manufacturer of 10 ppmv in the exhaust gas. An exhaust rate of 33,000 scfm is assumed by PCC based on the anticipated air injection rate into the absorption tower. Because all calculations are based on continuous operation (8,760 hours annually), actual emissions are the same as PTE.

NO_x Emissions – Nitric Acid Plants #1, #3, #4

NO _x Emissions	Controlled NO _x Emissions Factor (lb/ton-100% HNO ₃)	Control Efficiency (%)	Nitric Acid Produced (ton/hr)	Controlled NO _x Emissions	
				lb/hr	ton/yr
Plant #1 – EU Point 301	1.6 ¹ (3.0) ²	90	10.0	16.0 ¹ (30.0) ²	58.4 ³
Plant #3 – EU Point 302	1.6 ¹ (3.0) ²	90	7.5	12.0 ¹ (21.8) ²	43.8 ³

NO _x Emissions	Controlled NO _x Emissions Factor (lb/ton-100% HNO ₃)	Control Efficiency (%)	Nitric Acid Produced (ton/hr)	Controlled NO _x Emissions	
				lb/hr	ton/yr
Plant #4 – EU Point 303	2.5 ¹	95	16.7	41.75 ¹ (50.1) ²	159.7 ³

¹ 12-month rolling cumulative.

² 7-day average.

³ Requested enforceable limit.

The existing permit requires tracking nitric acid throughput to demonstrate compliance with the emissions limits and installation of continuous emissions monitoring systems (CEMS) to meet the requirements of compliance assurance monitoring (CAM). The CEMS units have been installed and the applicant requests to be relieved of the requirement to track throughput and rely on the CEMS to demonstrate compliance with the emissions limits.

CO Emissions – Nitric Acid Plants #1 and #3

CO Emissions	Controlled CO Emissions Factor (lb/ton)	Nitric Acid Produced (ton/hr)	Controlled CO Emissions	
			lb/hr	ton/yr
Plant #1 – EU Point 301	0.4	10.0	4.0	14.6*
Plant #3 – EU Point 302	0.4	7.5	3.0	11.0*
Totals			7.0	25.6

* Requested enforceable limit.

NH₃ Emissions – Nitric Acid Plant 4

NH ₃ Emissions	Controlled NH ₃ Emissions Factor (ppm)	Nitric Acid Produced (ton/hr)	Controlled NH ₃ Emissions	
			lb/hr	ton/yr
Plant #4 – EU Point 303	10.0	16.7	0.9	3.8*

There are no controls for CO emissions from the fumeabators. The CO emissions are collateral to the NSCR (i.e., fumeabator) operations at Nitric Acid Plants #1 and #3, similar to the NH₃ slip from the SCR operations on Nitric Acid Plant #4 to control NO_x emissions. A BACT analysis for CO emissions is included in Section VI of this memorandum.

For demonstration of compliance with the proposed CO and NH₃ permit limits, the applicant proposes initial performance testing at 90% of the short term maximum capacity to verify the emissions factors/rates.

EUG No. 4 – Nitric Acid Preheaters

Nitric Acid Plants #1, #3, and #4 – Preheaters

The preheaters at each of the three nitric acid plants are identical in heat input rating. Emissions generated from the Nitric Acid Plant Preheaters are primarily emissions of combustion. The maximum heat input rating of each heater is 20 MMBtu/hour. Operating 8,760 hours annually equates to a fuel demand of 175,200 MMBtu/year for each one. Calculations of combustion emissions are based on the emission factors listed in the table below and the fuel demand of 175,200 MMBtu/year, which equates to a natural gas fuel input of 171.76 MMscf/year based on a gross calorific value of 1,020 Btu/scf. Actual emissions are the same as potential to emit (PTE). The following table summarizes the methodology used to calculate emissions and the results of the calculations for the total combined emissions for the three preheaters.

Pollutant	Emission Factor		Source of Emission factor	Emissions	
	Value	Units		Maximum (lb/hr)	Annual (ton/yr)
CO	84.0	lbs/MMscf	AP-42; Table 1.4-1	4.95	21.63
NO _x	50.0	lbs/MMscf	AP-42; Table 1.4-1	2.94	12.87
PM	7.6	lbs/MMscf	AP-42; Table 1.4-2	0.45	1.95
PM ₁₀	5.7	lbs/MMscf	AP-42; Table 1.4-2	0.33	1.47
SO ₂	1.5	lbs/MMscf	AP-42; Table 1.4-2	0.09	0.39
VOC	5.5	lbs/MMscf	AP-42; Table 1.4-2	0.33	1.41

EUG No. 5 – Carbon Dioxide Vent

Calculations of CO emissions are based on mass balance using a known concentration of the subject pollutant from past operations, the maximum carbon dioxide throughput rate (maximum rate to CO₂ Plant), and continuous operation (8,760 hours per year). Note that the carbon dioxide venting considered here only occurs when the CO₂ Plant and the Urea Plant are shut down. Post startup operations indicated that CO₂ venting and CO emissions can occur from vents located at Ammonia Plant #4, (CO₂ Tower Vent, or EU ID 501a), the Carbon Dioxide Plant (CO₂ Vent, or EU ID 501b), or the Ammonia Plant #1 (Regenerator Tower Vent, or EU ID 501c). The CO limits have been adjusted to account for the revision of the Ammonia Plant #4 maximum production rate (i.e., change from 700 TPD to 770 TPD). Carbon dioxide is produced at a ratio of 1.25 ton/ton of ammonia production. CO is then calculated based on 0.1 lb/ton of carbon dioxide. The addition of emission points did not affect the rate, only where the venting can occur.

Pollutant	Emissions Factor	Carbon Dioxide Vented	Carbon Monoxide Emissions	
	lb/ton	ton/hr	lb/hr	ton/yr
CO	0.1	40.1	4.0	17.6

EUG No. 6 - Ammonium Nitrate Plants

Ammonium Nitrate Plant #1 and Plant #2 Neutralizers

Ammonium Nitrate Plant #1 and Plant #2 Neutralizers are identical in throughput capacity. Each plant is rated at an hourly liquid ammonium nitrate production capacity of 23.8 tons per hour and

an annual liquid ammonium nitrate production capacity of 208,488 tons per year. Emissions are controlled by in-stack condensers. As noted earlier, steam that is not condensed as a result of this heat transfer is subsequently condensed in a water cooled condenser. To reduce monitoring requirements, PCC has elected to make the neutralizers a closed process which effectively eliminates point source emissions. However, as a contingency for potential fugitive emissions, PCC estimates that 1% of the emission-laden steam escapes as opposed to the previously estimated 20%. This results in reduced emissions. Therefore, for this permit, calculations for emissions of ammonia and ammonium nitrate are based on the liquid ammonium nitrate production rate, emission factors used during Wil-Gro's operation of the facility, and continuous operation (8,760 hours per year). Emission factors were developed as illustrated in the table, where 0.4985 is the amount of steam emitted per ton of product and fugitive emissions are estimated at 1% (instead of the previous 20% scrubber efficiency considered prior to PCC's decision to implement a closed vent process). Concentration values of 1.0%, 0.05%, 0.5%, and 0.05% were used for hourly and annual emissions calculations for ammonia and ammonium nitrate (i.e., PM/PM₁₀), respectively. The reason that the hourly concentrations are different from the annual concentrations is because this is a batch process. Emissions of particulate matter are based on AP-42 emission factors. Actual emissions are the same as PTE. The following table summarizes the methodology used to calculate emissions and the results of the calculations for the total combined emissions from the two neutralizers.

Pollutant	Emission Factor	Source of Emission factor	Emissions	
	lbs/ton NH ₄ NO ₃		Max. (lb/hr)	Annual (ton/yr)
Non-PM Emissions				
NH ₃ (hourly)	0.0997	0.4985 x ton/ton x 1.0% x 1% x 2,000 lbs/ton	2.4	
NH ₃ (annual)	0.0050	0.4985 x ton/ton x 0.05% x 1% x 2,000 lbs/ton		0.6
PM Emissions				
PM/PM ₁₀ (hourly)	0.0499	0.4985 x ton/ton x 0.5% x 1% x 2,000 lbs/ton	1.2	
PM/PM ₁₀ (annual)	0.0050	0.4985 x ton/ton x 0.05% x 1% x 2,000 lbs/ton		0.6

Revisions to the table were made to account for the following:

- The hourly concentration value for ammonia, previously shown to be 0.5%, had been switched with the NH₄NO₃ value and has been corrected for this memorandum to 1% based on site specific data provided by PCC staff.
- The hourly NH₄NO₃ concentration value (1.0%) had been switched with the ammonia value and has been corrected (to 0.5%) based on site specific data provided by PCC staff.
- Concentration values are based on site specific testing conducted during previous operations at the plant. The concentration values used to calculate hourly emission rates reflect the highest, or worst case concentration values observed, and the concentration values used to calculate annual emission rates reflect the average concentration values observed.

For this permit, the applicant states that permitted emissions are for the neutralizer only. The rundown tanks for each process provide intermediate storage for ammonium nitrate product. Ammonia emissions from the rundown tank vents is minimal (similar to the Ammonia Nitrate Storage Tanks); these tanks are now proposed as insignificant sources.

Back half testing is not relevant to this issue. NH_4NO_3 , (as particulate matter) is emitted from the neutralizers and exists as condensable particulate in the steam that is emitted. All of the particulate matter emitted is condensable, or PM_{10} . The emissions estimates provided in the application use site specific information to calculate how much steam is emitted and how much condensable PM is contained in the steam; thus, the use of AP-42 factors to estimate any additional PM emissions would be double counting.

EUG No. 7 - Granulator Scrubbers

Granulator Scrubbers #1, #2, and #3

Granulator Scrubbers #1, #2, and #3 are identical in throughput capacity. Each scrubber is rated to handle emissions from the production of 16.7 tons per hour (146,292 tons per year) of dry ammonium nitrate. Emissions of ammonia and particulate matter are based on AP-42 emission factors and annual operating hours of 8,760. Actual emissions are the same as PTE. The following table summarizes the methodology used to calculate emissions and the results of the calculations for the total combined emissions for the three scrubbers.

Pollutant	Emission Factor	Source of Emission factor	Emissions	
	lbs/ton NH_4NO_3		Maximum (lb/hr)	Annual (ton/yr)
PM	0.04	AP-42, Table 8.3-2, pan granulators	2.1	8.8
PM_{10}	0.04	AP-42, Table 8.3-2, pan granulators	2.1	8.8
NH_3	0.14	AP-42, Table 8.3-2, pan granulators	7.0	30.7

EUG No. 8 - Boilers

Boiler #1 and Boiler #2

The application for this permit revises the rating for Boiler #1 from 80.0 MMBtu/hr in the existing permit down to 53 MMBtu/hr. The heat input rating of Boiler #2 remains at 80.0 MMBtu/hour. Calculations of combustion emissions are based on the emission factors listed in the table below, fuel having a gross calorific value of 1,020 Btu/scf, and annual operating hours of 8,760. Actual emissions are the same as potential to emit (PTE). The following tables summarize the methodology used to calculate emissions and the results of the calculations for each boiler.

Boiler #1, EU ID 801

Pollutant	Emission Factor		Source of Emission factor	Emissions	
	Value	Units		Maximum (lb/hr)	Annual (ton/yr)
CO	84.0	lbs/MMscf	AP-42; Table 1.4-1	4.4	19.2
NO_x	50.0	lbs/MMscf	AP-42; Table 1.4-1	2.6	11.4
PM	7.6	lbs/MMscf	AP-42; Table 1.4-2	0.4	1.8
PM_{10}	5.7	lbs/MMscf	AP-42; Table 1.4-2	0.3	1.3
SO_2 *	1.5	lbs/MMscf	AP-42; Table 1.4-2	0.1	0.4
VOC	5.5	lbs/MMscf	AP-42; Table 1.4-2	0.3	1.3
Formaldehyde	0.075	lbs/MMscf	AP-42; Table 1.4-3	0.01	0.02

Boiler #2, EU ID 802

Pollutant	Emission Factor		Source of Emission factor	Emissions	
	Value	Units		Maximum (lb/hr)	Annual (ton/yr)
CO	84.0	lbs/MMscf	AP-42; Table 1.4-1	6.6	28.9
NO _x	50.0	lbs/MMscf	AP-42; Table 1.4-1	4.0	17.2
PM	7.6	lbs/MMscf	AP-42; Table 1.4-2	0.6	2.7
PM ₁₀	5.7	lbs/MMscf	AP-42; Table 1.4-2	0.5	2.0
SO ₂ *	1.5	lbs/MMscf	AP-42; Table 1.4-2	0.2	0.6
VOC	5.5	lbs/MMscf	AP-42; Table 1.4-2	0.5	1.9
Formaldehyde	0.075	lbs/MMscf	AP-42; Table 1.4-3	0.01	0.03

* See discussion above under Primary Reformer emissions for derivation of emission factor.

EUG No. 9 - Cooling Towers

Cooling Tower #1 has a circulation capacity of 1,470,000 gallons per hour and uses an induced draft system. It uses no chromium additives, and the only pollutant emitted is particulate matter. Calculations of emissions are based on information provided by the manufacturer. A total liquid drift (TLD) of 0.008%, a total dissolved solids (TDS) of 1,200 ppmw, and annual operating hours of 8,760 were used to calculate the emissions indicated in the table below. One of five cells in Cooling Tower #1 was upgraded to meet the proposed drift elimination values that result in the proposed particulate emission rates. The other four cells will be upgraded as they are needed for cooling. Recent work has been done at Cooling Tower #1 to add additional cells that will be needed when Nitric Acid Plant #1 and #3 and Ammonia Plants #1 and #3 (idled sources) come on line. Revised calculations that reflect the change in circulation rate (and resultant PM emissions) were submitted with the idled source application.

Actual emissions are the same as potential to emit (PTE) and all PM is assumed to be PM₁₀ or below. The following table summarizes the methodology used to calculate emissions and the results of the calculations for Cooling Tower #1.

Cooling Tower #1

Pollutant	Emission Factor		Source of Emission factor	Emissions	
	Value	Units		Maximum (lb/hr)	Annual (ton/yr)
PM	0.001	lbs/10 ³ gal	Manufacturer's Data	1.2	5.2
PM ₁₀	0.001	lbs/10 ³ gal	Manufacturer's Data	1.2	5.2

Cooling Tower #2 has a circulation capacity of 2,400,000 gallons per hour and uses an induced draft system. It uses no chromium additives, and the only emission is particulate matter. Calculations of emissions are based on information provided by the manufacturer. A TLD of 0.008%, a TDS of 1,200 ppmw, and annual operating hours of 8,760 were used to calculate the emissions indicated in the table below. Cooling Tower #2 has been upgraded to meet the proposed drift elimination values. Actual emissions are the same as potential to emit (PTE). The following table summarizes the methodology used to calculate emissions and the results of the calculations for Cooling Tower #2.

Cooling Tower #2

Pollutant	Emission Factor		Source of Emission factor	Emissions	
	Value	Units		Maximum (lb/hr)	Annual (ton/yr)
PM	0.001	lbs/10 ³ gal	Manufacturer's Data	2.0	8.5
PM ₁₀	0.001	lbs/10 ³ gal	Manufacturer's Data	2.0	8.5

EUG No. 10 - Fugitives – Valves/Seals/Flanges/Connections

Supplemental information concerning non-VOC fugitives from equipment in anhydrous ammonia service and 16% Ammonia Solution was submitted by PCC based on numerous potential sources considered throughout the facility. PCC offers the following calculations, which is considered to represent a conservatively high estimate, based on the approximate number of components in service and emission factors from "Emission Estimation Technique Manual for Synthetic Ammonia Manufacturing", March 2004, Table 8.

Fugitive Emissions (Process Piping in Anhydrous Ammonia Service)

Component Type	Type of Service	Count	Emissions Factors (lb/hr-component)	Potential Emissions	
				(lb/hr)	(ton/yr)
Valves	Gas	57	0.0132	0.8	3.3
	Light Liquid	114	0.0089	1.0	4.5
Pump Seals	Light Liquid	3	0.0439	0.2	0.6
Compressor Seals	Gas	2	0.5027	1.0	4.4
Pressure Relief Valves	Gas	12	0.2293	2.8	12.1
Connectors	All	113	0.0041	0.5	2.1
Open-ended Lines	All	5	0.0038	0.1	0.1
Sampling Connections	All	5	0.0331	0.2	0.8
Total				6.6	27.9

Fugitive Emissions (Process Piping in 16% Aqueous Ammonia Solution Service)

Component Type	Type of Service	Count	Emissions Factors (lb/hr-component)	Potential Emissions	
				(lb/hr)	(lb/hr)
Valves	Gas	228	0.002112	0.5	2.1
	Light Liquid	456	0.001424	0.7	2.9
Pump Seals	Light Liquid	12	0.007024	0.1	0.4
Compressor Seals	Gas	8	0.080432	0.7	2.9
Pressure Relief Valves	Gas	46	0.036688	1.7	7.4
Connectors	All	450	0.000656	0.3	1.3
Open-ended Lines	All	20	0.000608	0.1	0.1
Sampling	All	20	0.005296	0.1	0.5

Component Type	Type of Service	Count	Emissions Factors (lb/hr-component)	Potential Emissions	
				(lb/hr)	(lb/hr)
Connections					
Total				4.2	17.6

Emissions Summary

The following table is a condensed summary of the calculated emissions. Since Oklahoma rules require reporting the back half of the sampling train when testing for PM₁₀, the value for PM is used as PM₁₀ in setting the permit limits.

EUG/EU	NO _x (TPY)	CO (TPY)	PM ₁₀ (TPY)	VOC (TPY)	SO ₂ (TPY)	NH ₃ (TPY)
EUG No. 1 – Ammonia Plant						
Primary Reformer (Limits for NO _x are effective through 1-year trial BACT)	118.3	81.2	5.5	5.3	2.9	
Condensate Steam Flash Drum				45.6		23.6
EUG No. 3 – Nitric Acid Plants						
Plant #1 – EU Point 301	58.4	14.6				
Plant #3 – EU Point 302	43.8	11.0				
Plant #4 – EU Point 303	159.7					3.8
EUG No. 4 – Nitric Acid Heaters						
Plant #1, #3, and #4 – Preheaters	12.9	21.6	1.5	1.4	0.4	
EUG No. 5 – Carbon Dioxide Vent		17.6				
EUG No. 6 – Ammonium Nitrate Plants						
Plant #1 and Plant #2			0.6			0.6
EUG No. 7 – Granulator Scrubbers						
Granulator Scrubber #1, #2, and #3			8.8			30.7
EUG No. 8 – Boilers						
Boiler #1	11.4	19.2	1.3	1.3	0.4	
Boiler #2	17.2	28.9	2.0	1.9	0.6	
EUG No. 9 – Cooling Towers						
Cooling Tower No. 1			5.2			
Cooling Tower No. 2			8.5			
EUG No. 10 – Fugitives						45.5
Totals	421.7	194.1	33.4	55.5	4.3	104.2

Assessment of PM_{2.5} Emissions

The applicant has provided an assessment of PM_{2.5} emissions using a ratio method, with values obtained from Appendix B-2 (9/90 reformatted 9/95), Generalized Particle Size Distribution, (AP 42, *Compilation of Air Pollutant Emission Factors*), pages B.2-12 and B.2-19. For processes where the applicant was not able to find a suitable particle size ratio, a worst case scenario of 100% of PM as PM_{2.5} is assumed.

EID #	Source	PM (lb/hr)	PM (TPY)	PM ₁₀ (lb/hr)	PM ₁₀ (TPY)	PM _{2.5} Ratio (%)	PM _{2.5} (lb/hr)	PM _{2.5} (TPY)
101	Ammonia Plant #4	1.7	7.4	1.3	5.6	45.0%	0.8	3.3
401	Nitric Acid Plant	0.2	0.7	0.1	0.5	45.0%	0.1	0.3

EID #	Source	PM (lb/hr)	PM (TPY)	PM ₁₀ (lb/hr)	PM ₁₀ (TPY)	PM _{2.5} Ratio (%)	PM _{2.5} (lb/hr)	PM _{2.5} (TPY)
	Preheater #1							
402	Nitric Acid Plant Preheater #3	0.2	0.7	0.1	0.5	45.0%	0.1	0.3
403	Nitric Acid Plant Preheater #4	0.2	0.7	0.1	0.5	45.0%	0.1	0.3
601	Ammonium Nitrate Plant #1	1.2	0.6	1.2	0.6	78.0%	0.9	0.5
602	Ammonium Nitrate Plant #2	1.2	0.6	1.2	0.6	78.0%	0.9	0.5
701	Granulator Scrubber #1	0.7	2.9	0.7	2.9	100.0%	0.7	2.9
702	Granulator Scrubber #2	0.7	2.9	0.7	2.9	100.0%	0.7	2.9
703	Granulator Scrubber #3	0.7	2.9	0.7	2.9	100.0%	0.7	2.9
801	Boiler #1	0.4	1.8	0.3	1.3	45.0%	0.2	0.8
802	Boiler #2	0.6	2.6	0.5	2.0	45.0%	0.3	1.2
901	Cooling Tower #1	1.2	5.2	1.2	5.2	100.0%	1.2	5.2
902	Cooling Tower #2	2	8.5	2	8.5	100.0%	2.0	8.5
Totals							9.3	32.3

SECTION V. INSIGNIFICANT ACTIVITIES

The insignificant activities identified and justified in the application are duplicated in the following table. Appropriate recordkeeping for these activities is indicated under Paragraph 1 below with an “*”; additional detail is included in the Specific Conditions, as appropriate.

- * Emissions from storage tanks constructed with a capacity less than 39,894 gallons, which store VOC with a vapor pressure less than 1.5 psia at maximum storage temperature. There are no tanks storing VOC at the facility. The applicant lists the following tanks.

Name and Contents	Capacity (gallons)
Urea Plant Feed (Ammonia Head Tank)	15,857
#2 Urea Plant Ammonia Recovery Tank	9,406
CO2 Plant Ammonia Recovery Tank	1,128
Ammonium Nitrate Plant #1 Rundown Tank	950
Ammonium Nitrate Plant #2 Rundown Tank	950
AU & BU Urea Blend Tanks	10,000
OBT Mix Tank	36,500

- * Activities having the potential to emit no more than 5 TPY (actual) of any criteria pollutant.

Name and Contents	Capacity (gallons)
Atmospheric Anhydrous Ammonia Storage Tank	5,640,000
Wastewater Storage Tank	1,000,000
2100 Nitric Acid Storage Tank	389,243
200 Nitric Acid Storage Tank	62,563
Ammonium Nitrate Storage Tank	267,314
U.A.N. Blend Tank	57,337
2 – U.A.N. Storage Tanks (AS & DS)	3,760,346 each
2 – U.A.N. Storage Tanks (BS & CS)	116,471 each
RO Treated Water Storage Tank	50,000
5 – Pressurized Anhydrous Ammonia Storage Tanks	78,800 each

Granular Ammonium Nitrate Storage, Handling, and Loading/Unloading operations
 Ammonia Truck and Railcar Loading
 Ammonia Plant #4 Fugitives
 Nitric Acid Loading to Trucks and Railcars
 Off-Specification UAN and AN loading to Trucks and Railcars
 Ammonia Plant #4 Desulfurization Unit – Carbon Regeneration Using Steam
 Ammonia Storage Flare

The ammonia storage flare is used only in case of emergency/equipment malfunction, primarily when there is a power failure affecting the ammonia storage tank refrigeration systems. There are primary and secondary refrigeration compressors on the storage tank that are connected to different electrical services. As ammonia product is pumped to the tank, the tendency is for some ammonia to vaporize out of the liquid state at the top of the tank. This vapor is then picked up by the primary refrigeration unit, which converts it back to liquid and then sends it in a return loop back into the tank. If a power failure occurs affecting the primary unit, the secondary unit is engaged and the refrigeration return loop is continued. This transition to the secondary unit (or backup refrigeration system) happens very quickly, usually occurring in less than 5 minutes, and would not likely result in any ammonia being vented to the flare. If a power failure occurs affecting both the primary and the secondary refrigeration compressors, the ammonia plant would also be affected, or shut down. Thus, the only potential scenario whereby ammonia would be vented to the flare occurs due to a rise in the temperature of the tank as it is affected by ambient conditions. This temperature rise is somewhat controlled by an 8-inch layer of insulation installed on the tank. Once the temperature of the tank is sufficient to vaporize the liquid ammonia, a pressure vent releases, and the vapor is released to the flare. The ammonia storage tank pressure relief vent is set to open when total pressure rises above maximum storage pressure by a margin of 1.5 psig. Note that a power failure affecting both refrigeration units would be extremely rare. Historical experience indicates that a power failure of this type has only happened two or three

times, with a maximum electrical system downtime of two hours. An employee of the previous operator recalls that the flare operated only three times during the last three years that the plant was in operation. The Ammonia Storage Flare Pilot runs continuously so that the flare is ready to be ignited whenever needed. Emissions from the Ammonia Storage Flare Pilot are generated from the combustion of natural gas on a constant schedule. The maximum heat input rating of the Ammonia Storage Flare Pilot is 0.0152 MMBtu/hour. Operating 8,760 hours annually equates to a fuel demand of 133 MMBtu/year. Calculations of combustion emissions are based on the emission factors listed in the table below and the fuel demand of 133 MMBtu/year, which equates to a natural gas fuel input of 0.1305 MMscf/year based on a gross calorific value of 1,020 Btu/scf. Actual emissions are the same as potential to emit (PTE). The following table summarizes the methodology used to calculate emissions and the results of the calculations for the total combined emissions for the flare.

Pollutant	Emission Factor		Source of Emission factor	Emissions	
	Value	Units		Maximum (lb/hr)	Annual (ton/yr)
CO	84.0	lbs/MMscf	AP-42; Table 1.4-1	0.00125	0.0055
NO _x	50.0	lbs/MMscf	AP-42; Table 1.4-1	0.00075	0.0033
PM	7.6	lbs/MMscf	AP-42; Table 1.4-2	0.00011	0.0005
PM ₁₀	5.7	lbs/MMscf	AP-42; Table 1.4-2	0.00008	0.0004
SO ₂ *	1.5	lbs/MMscf	AP-42; Table 1.4-2	0.00002	0.0001
VOC	5.5	lbs/MMscf	AP-42; Table 1.4-2	0.00008	0.0004

* See discussion above under Primary Reformer emissions for derivation of emission factor.

For emissions generated when burning ammonia in the flare, the applicant has estimated emissions based on a technical bulletin published by the Texas Commission on Environmental Quality (TCEQ) for burning waste gas containing ammonia. The flare is a smokeless flare designed to burn waste ammonia at a rate of approximately 1,405 lb ammonia/hr from the storage tank. The flare system has a 99% destruction efficiency for ammonia. The TCEQ bulletin works an example emissions calculation for a waste gas stream containing mostly ethylene, ethane, and butane, with smaller amounts of propylene, propane, ammonia, and hydrogen (by mass content).

To estimate emissions generated from the flare at the Pryor Chemical Company facility, PCC converted the mass of ammonia burned (1,405 lbs/hr) to a volumetric flow rate of 530 scfm and estimated that a volume of assist natural gas of 250 scfm is needed to bring the heat input value of the mixture to 566 Btu/scf for proper combustion, for a total gas mixture flow rate of 780 scf/minute. PCC then used the emission factors from the bulletin to calculate emissions of NO_x and CO and assumed that excess ammonia not converted to NO_x is converted to inert products such as nitrogen and water. The emission factor for NO_x from the TCEQ bulletin happens to be twice that of the factor found in Table 13.5-1 of AP-42 for industrial flares. The AP-42 bulletin states that waste gases to be flared must have a fuel value of at least 200 to 250 Btu/ft³ for complete combustion; otherwise fuel must be added. Further into the discussion, the bulletin states that flare gases with less than 450 Btu/ft³ do not smoke. It also states that in some cases,

even flaring waste gases having the necessary heat content will also require supplemental heat and that if fuel-bound nitrogen is present, flaring ammonia with a heating value of 365 Btu/ft³ will require higher heat to minimize nitrogen oxides (NO_x) formation. Therefore, it appears based on this limited information, that PCC has chosen the proper range of fuel heat value to minimize smoke and NO_x emissions. PCC's estimates of emissions are:

NO_x emissions:

$$0.138 \text{ lb/MMBtu} \times 566 \text{ Btu/scf} \times 1 \text{ MMBtu}/10^6 \text{ Btu} \times 780 \text{ scf/min} \times 60 \text{ min/hr} = 3.66 \text{ lb/hr}$$

CO emissions:

$$0.2755 \text{ lb/MMBtu} \times 566 \text{ Btu/scf} \times 1 \text{ MMBtu}/10^6 \text{ Btu} \times 780 \text{ scf/min} \times 60 \text{ min/hr} = 7.30 \text{ lb/hr}$$

Emission rates in ton/yr have not been calculated due to the limited amount of time the system would be venting to the flare under emergency conditions.

SECTION VI. PREVENTION OF SIGNIFICANT DETERIORATION ANALYSIS

As explained in the Introduction of this memorandum, in 2010, PCC replaced the existing burners of the Primary Reformer in Ammonia Plant #4. Testing performed December 29, 2010 through January 11, 2011, indicated that NO_x emissions exceed the permitted PSD limits, triggering a new PSD analysis. Emissions averaged 0.108 Lbs-NO_x/MMBtu or approximately 17.22 lbs-NO_x/hr. The permit limits are 0.053 lbs-NO_x/MMBtu (BACT) and 11.93 lbs-NO_x/hr (NAAQS). Additionally, DEQ required PSD analysis for emissions of CO from the fumeabators on the #1 and #3 Nitric Acid Plants, which was left out of the first permit. These two nitric acid plants utilize extended adsorption design technology to reduce NO_x emissions prior to further treatment in the fumeabators. CO emissions result from the introduction of fuel gas (i.e., natural gas and purge gas from Ammonia Plant #4) and its associated combustion in the fumeabators on Nitric Acid Plants #1 and #3.

The applicant offers the following explanation for CO emissions. The carbon monoxide emissions from the #1 and #3 Nitric Acid Plants result from combustion of fuel gas in the NSCR combustor, or fumeabator, for each plant. This increase in CO is considered justifiable because the levels at which uncontrolled NO_x would be emitted are of greater concern than the relatively low levels of CO emissions that result. By injecting fuel gas, the units use all of the available oxygen while the NSCR system reduces the fuel gas and NO_x to N₂, CO₂, CO, and H₂O. CO emissions from the plant tend to increase with the ratio of fuel gas to oxygen and NO_x going to the combustor. For most catalysts, effectiveness degrades slowly over time, requiring an entire bed change approximately every two to six years. Therefore, keeping all other variables constant, NO_x emissions would tend to increase over time if nothing else was done. To counter this effect, the amount of fuel gas fed to the combustor is increased over time, which in turn

raises the ratio, and ultimately CO emissions. This effect is represented by the "R-factor", which is the ratio of the actual amount of fuel gas feed to the combustor versus the stoichiometric amount of fuel gas needed to reduce the NO_x to water and elemental nitrogen. Proper operation of the NSCR devices is indicated by the R-factor. The goal is to keep the R-factor as close to one as possible. If the factor is less than one, then unreacted NO_x can leave the system and can cause non-compliance with the facility's short-term limits. A very high R-factor can drive NO_x emissions down; however, this condition indicates that too much fuel gas is being fed to the combustor. This can result in higher than necessary CO emissions and wasted fuel gas.

This PSD analysis is limited to the sources described above. Discussion for all other sources remains unchanged and can be found in the permit memorandum and application for Permit No. 2008-100-C PSD.

A. Best Available Control Technology Analysis

Pursuant to the PSD regulations, a Best Available Control Technology (BACT) analysis is a required part of a PSD permit application for each new emission unit and for each affected emission unit that is undergoing a physical change or change in the method of operation that results in a significant increase in emissions. The BACT analysis is a case-by-case analysis that takes into account technical feasibility, energy and environmental impacts, and cost. An integral part of the BACT analysis is a search of the US EPA's RACT/BACT/LAER Clearinghouse (RBLC).

The BACT analysis follows the "top-down" approach. Following are the five basic steps of a "top-down" BACT analysis:

- Step 1: Identify all control technologies.
- Step 2: Eliminate technically infeasible options.
- Step 3: Rank remaining control technologies by control effectiveness.
- Step 4: Evaluate most effective controls and document results.
- Step 5: Select BACT and document the selection as BACT.

Ammonia Plant #4 Primary Reformer – NO_x Emissions

Step 1: Identify All Control Technologies.

A search of the RBLC was conducted to identify technologies for the control of NO_x emissions from Primary Reformer at Ammonia Plant #4. As was the situation for the previous permit, there were no entries for emissions from ammonia plants in the database. Because the NO_x emissions from the ammonia plants at PCC are due to the natural gas combustion at the primary reformers, again a search of the RBLC was conducted to identify control technologies for the control of NO_x emissions and emission rates from natural gas-fired boilers. Due to the magnitude and similarity of results returned for this type of source, a search was only conducted from January 2002 to present. The following tables summarize the results of the search. The net result was 66 facilities with 63 applications of Low NO_x Burners, compared to the previous search

yielding 59 facilities with 55 applications of Low NO_x Burners. The other 4 control technology determinations are no controls.

Control Equipment	Number of Facilities
No Controls Listed	4
Low NO _x Burners	67

Natural Gas Combustion Equipment (Boilers/Pre-Heaters/Reformer) – NO_x

RBLC ID	Facility Name	Control Technology	RBLC Emission Rate	Emission Rate (lb/MMBtu)
NV-0047	Nellis Air Force Base	Low NO _x Burner	0.030 lb/MMBtu	0.030
GA-0130	Kia Motors	Low NO _x Burner	0.090 lb/MMBtu	0.090
MD-0040	Competitive Power Ventures	Low NO _x Burner	0.011 lb/MMBtu	0.011
WA-0316	Northwest Pipeline	Low NO _x Burner	0.040 lb/MMBtu	0.040
LA-0192	Crescent City Power	Low NO _x Burner	0.095 lb/MMBtu	0.095
OR-0048	Portland General Electric	Low NO _x Burner	0.050 lb/MMBtu	0.050
NV-0049	Harrah's Operating Co.	Low NO _x Burners	0.0300 lb/MMBtu 0.0353 lb/MMBtu 0.0306 lb/MMBtu 0.0350 lb/MMBtu 0.0367 lb/MMBtu	0.0300 0.0353 0.0306 0.0350 0.0367
NV-0046	Kern River Gas Boiler - 3.85 MMBTUH	No Control	0.1010 lb/MMBtu	0.101
WI-0227	WEPCO Boiler – 97.1 MMBTUH Heater – 10 MMBTUH	No Control	13.7 lb/hr 0.100 lb/MMBTU	0.142 0.100
OR-0040	Klamath Generation Boiler – 50,000 lb/hr	No Control	30 ppm	NA

RBLC ID	Facility Name	Control Technology	RBLC Emission Rate	Emission Rate (lb/MMBtu)
TN-0153	Williams Refining Heater – 209 MMBTUH Heater – 9.1 MMBTUH Heater – 500 MMBTUH (2) Heaters 166.5 MMBTUH Heater – 42.2 MMBTUH Reboiler – 166.5 MMBTUH Boiler – 95 MMBTUH Boiler – 180 MMBTUH Reboiler – 54 MMBTUH	No Control	0.030 lb/MMBtu 0.140 lb/MMBtu 0.600 lb/MMBtu 0.050 lb/MMBtu 0.073 lb/MMBtu 0.050 lb/MMBtu 0.084 lb/MMBtu 0.060 lb/MMBtu 0.060 lb/MMBtu	0.030 0.140 0.600 0.050 0.073 0.050 0.084 0.060 0.060
OH-0309	Daimler Chrysler Corporation (2) Boilers – 20.4 MMBTUH	Low NO _x Burner	0.72 lb/hr (LAER)	0.035
NV-0044	Harrah's Entertainment Boiler - 35.4 MMBTUH	Low NO _x Burner	0.035 lb/MMBtu	0.035
CA-1127	Genentech Boiler - 97 MMBTUH	Low NO _x Burner	9 ppm	NA
AK-0062	PB Exploration Heater – 34 MMBTUH Heater - 14.87 MMBTUH Reboiler – 1.34	Low NO _x Burner	0.095 lb/MMBtu Not Listed 0.08 lb/MMBtu	0.095 NA 0.08
OH-0252	Duke Energy – Hanging Rock (2) Boilers - 13.31 MMBTUH	Low NO _x Burner	1.07 lb/hr	0.08
AZ-0047	Dome Valley Energy Boiler - 38 MMBTUH	Low NO _x Burner	0.37 lb/MMBtu	0.37
AL-0212	Hyundai Motors Boiler - 24.5 MMBTUH	Low NO _x Burner	0.35 lb/MMBtu	0.35
WI-0226	Wisconsin Public Service Boiler - 46.2 MMBTUH	Low NO _x Burner	1.67 lb/hr	0.036

RBLC ID	Facility Name	Control Technology	RBLC Emission Rate	Emission Rate (lb/MMBtu)
AR-0077	Steelcorr – Bluewater Boiler - 22 Boiler – 51 Tunnel Furnace – 160 MMBTUH	Low NO _x Burner	0.08 lb/MMBtu 0.08 lb/MMBtu 0.10 lb/MMBtu	0.08 0.08 0.10
MN-0053	Minnesota Municipal Power Boiler – 40 MMBTUH	Low NO _x Burner	0.04 lb/MMBtu	0.04
WV-0021	Cabot Corporation Boiler - 42.5 MMBTUH * Heater - 42.5 MMBTUH *	Low NO _x Burner	2.08 lb/hr 2.09 lb/hr	0.049 0.049
NV-0037	Sempra Energy Boiler – 60 MMBTUH	Low NO _x Burner	0.035 lb/MMBtu	0.035
ID-0015	J.R. Simplot Company Boiler – 64 MMBTUH Boiler - 175 MMBTUH	Low NO _x Burner	2.88 lb/hr (RACT) 7.0 lb/hr	0.045 0.040
AL-0191	Hyundai Motors (3) Boilers - 50 MMBTUH	Low NO _x Burner	1.75 lb/hr	0.035
AR-0076	Pine Bluff Arsenal (3) Boilers - 28.4 MMBTUH (2) Boilers - 11.7 MMBTUH Boiler - 1.4 MMBTUH	Low NO _x Burner	1.5 lb/hr 0.6 lb/hr 0.2 lb/hr	0.053 0.051 0.143
OK-0097	Quad Graphics Boiler – Rating Not Listed Heater – 16 MMBTUH	Low NO _x Burner	0.035 lb/MMBtu 2.48 lb/hr	0.035 0.155
WI-0207	Ace Ethanol Boiler – 60 MMBTUH Boiler – 80 MMBTUH Boiler – 11 MMBTUH Boiler - 34 MMBTUH	Low NO _x Burner	0.04 lb/MMBtu 0.04 lb/MMBtu 0.04 lb/MMBtu 0.04 lb/MMBtu	0.04 0.04 0.04 0.04
OR-0039	People's Energy (2) Boilers – 80 MMBTUH	Low NO _x Burner	0.035 lb/MMBtu	
MN-0054	Mankato Energy Center Boiler – 70 MMBTUH	Low NO _x Burner	0.036 lb/MMBtu	0.036

RBLC ID	Facility Name	Control Technology	RBLC Emission Rate	Emission Rate (lb/MMBtu)
IN-0108	Nucor Steel (2) Boilers – 34 MMBTUH	Low NO _x Burner	0.035 lb/MMBtu	0.035
MI-0355	Abbott Laboratories Boiler - 98.51 MMBTUH	Low NO _x Burner	0.08 lb/MMBtu	0.08
AZ-0049	Allegheny Energy – La Paz Boiler – 41 MMBTUH Boiler - 55.34 MMBTUH	Low NO _x Burner	0.027 lb/MMBtu 0.036 lb/MMBtu	0.027 0.036
OH-0254	Duke Energy – Washington County Boiler - 30.6 MMBTUH	Low NO _x Burner	1.08 lb/hr	0.035
TX-0458	Duke Energy – Jack County Boiler – 36 MMBTUH	Low NO _x Burner	1.3 lb/hr	0.036
OH-0276	Charter Manufacturing Boiler - 28.6 MMBTUH	Low NO _x Burner	2.8 lb/hr	0.098
WA-0316	Northwest Pipeline Corp. Boiler - 4.19 MMBTUH	Low NO _x Burner	34 ppm	NA
GA-0098	Genpower Rincon Boiler - 83 MMBTUH	Low NO _x Burner	0.055 lb/MMBtu	0.055
VA-0271	City of Harrisonburg 43.2 MMBTUH	Low NO _x Burner	6.17 lb/hr	0.143
OK-0090	Duke Energy Boiler - 33 MMBTUH	Low NO _x Burner	0.05 lb/MMBtu	0.05
PA-0216	J&L Specialty Steel Boiler - 33.5 MMBTUH	Low NO _x Burner	30 ppm	NA
WA-0291	Wallula Generation Boiler - 55.3 MMBTUH	Low NO _x Burner	30 ppm	NA
TX-0389	Degussa Engineered Carbons Boiler – 13.4 MMBTUH	Low NO _x Burner	1.4 lb/hr	0.104
IA-0062	Interstate Power and Light Boiler - 68 MMBTUH	Low NO _x Burner	0.049 lb/MMBtu	0.049
TX-0354	Atofina Chemicals (2) Boilers – 15.8 MMBTUH	Low NO _x Burner	2.05 lb/hr	0.130
TX-0408	Indian Rock Gathering Co. Boiler - 6 MMBTUH	Low NO _x Burner	0.59 lb/hr	0.098

RBLC ID	Facility Name	Control Technology	RBLC Emission Rate	Emission Rate (lb/MMBtu)
VA-0260	Cogentrix Energy (2) Boilers - 40 MMBTUH	Low NO _x Burner	3.2 lb/hr	0.08
VA-0255	Virginia Power ** Boiler - 99 MMBTUH	Low NO _x Burner	0.036 lb/MMBtu	0.036
GA-0101	Duke Energy – Murray Boiler - 31.4 MMBTUH	Low NO _x Burner	30 ppm	NA
AL-0192	Honda – Alabama (3) Boilers – 30 MMBTUH	Low NO _x Burner	1.05 lb/hr	0.05
CA-1023	LA County Services Boiler - 39 MMBTUH	Low NO _x Burner	9 ppm	NA
OH-0248	Calpine – Lawrence Boiler – 99 MBTUH	Low NO _x Burner	4.95 lb/hr	0.05
VA-0261	Competitive Power – Cunningham Creek Boiler - 80 MMBTUH	Low NO _x Burner	3.82 lb/hr	0.048
AR-0070	Genova Arkansas Boiler – 33 MMBTUH	Low NO _x Burner	0.04 lb/MMBtu	0.04
IA-0060	Entergy – Hawkeye Boiler - 48.69 MMBTUH	Low NO _x Burner	0.034 lb/MMBtu	0.034
AL-0185	Barton Shoals (2) Boilers – 40 MMBTUH	Low NO _x Burner	0.05 lb/MMBtu	0.05
TX-0437	Hartburg Power Boiler – 40 MMBTUH	Low NO _x Burner	Not Listed	NA
NM-0044	Duke Energy Curry (2) Boilers – 33 MMBTUH	Low NO _x Burner	1.2 lb/hr	0.036
OK-0070	Genova Oklahoma Power Boiler – 33 MMBTUH	Low NO _x Burner	0.035 lb/MMBtu	0.035
OK-0072	RedBud Energy Boiler – 93 MMBTUH	Low NO _x Burner	0.075 lb/MMBtu	0.075
IA-0058	MidAmerican Energy – Des Moines Boiler – 68 MMBTUH	Low NO _x Burner	0.05 lb/MMBtu	0.05
AR-0051	Duke Energy – Jackson Boiler – 33 MMBTUH	Low NO _x Burner	0.035 lb/MMBtu	0.035
OK-0055	Mustang Power – Mustang Boiler – 31 MMBTUH	Low NO _x Burner	0.01 lb/MMBtu	0.01

RBLC ID	Facility Name	Control Technology	RBLC Emission Rate	Emission Rate (lb/MMBtu)
OK-0056	Mustang Power – Horseshoe NA	Low NO _x Burner	0.10 lb/MMBtu	0.10
LA-0174	GP Port Hudson Boiler – 987 MMBTUH	Low NO _x Burner	61.34 lb/hr	0.062
NC-0094	Genpower – Earleys Boiler – 83 MMBTUH	Low NO _x Burner	4.07 lb/hr	0.049

Step 2: Eliminate Technically Infeasible Options.

None

Step 3: Rank Remaining Control Technologies by Control Effectiveness.

Only low NO_x technology was listed for the control of NO_x emissions at natural gas-fired boilers.

Step 4: Evaluate Most Effective Controls and Document Results.

No Control or Good Combustion or Boiler Design: All but 4 entries in the RBLC specified low NO_x burners as meeting the BACT requirement for the control of NO_x emissions from natural gas-fired boilers.

Step 5: Select BACT.

For Permit No. 2008-100-C PSD, the manufacturer of the natural gas-fired Primary Reformer provided a maximum NO_x emission rate of 0.053 lb-NO_x /MMBtu for the original burners. Numerous facilities listed had BACT limits that equal or exceed this value for natural gas-fired boilers equipped with low NO_x burners. Based on this, the applicant requested a BACT limit to be no greater than the manufacturer's guaranteed emission rate of 0.053 lb/MMBtu with the use of low NO_x burners selected as BACT.

Sometime after startup during 2010, the burners in Ammonia Plant #4 Primary reformer were replaced. The manufacturer of the new burners guaranteed NO_x emissions rates to 0.059 lbs-NO_x/MMBtu, but testing by PCC demonstrated that average emissions from the new burners are as high as 0.108 Lbs-NO_x/MMBtu, approximately 17.22 lbs-NO_x /hr. PCC believes that the manufacturer's guarantees cannot be met by a primary reformer because they are more representative of a boiler and that there are fundamental differences in the combustion processes and resulting emissions generated. The applicant therefore requests approval to conduct a post-operation trial BACT analysis over a period of one year that will be used to determine a final permitted emissions rate. The justification for this request with supportive documentation is contained in the applicant's submittals titled "Operating Permit Application – Supplemental Regulatory Determination, Pryor Chemical Company, Mid-America Industrial park, Pryor, Mayes

County, Operating Permit No. 2008-100-TV (PSD)” and “Pryor Chemical Company Part 70 Construction permit Consolidation Application”.

PCC has proposed a one-year trial BACT limit of 0.12 lbs-NO_x/MMBtu and an hourly NAAQS limit of 27.0 lbs-NO_x/hr to be effective while conducting various engineering studies in conjunction with emissions testing to determine economically feasible means of minimizing NO_x emissions. The applicant submitted a list of proposed elements of the BACT analysis. DEQ has revised it as follows:

- 1) An assessment of the design operating conditions and fuel characteristics that form the basis for the burner manufacturer’s emissions guarantee, including the properties of the fuel gases.
- 2) A review of the combustion and process controls affecting the Primary Reformer to identify potential methods to reduce/minimize NO_x emissions, including burner tuning and automation improvements.
- 3) A review of facility operating procedures to identify potential techniques to reduce/minimize NO_x emissions.
- 4) A review of any methods currently in place to minimize the components of waste fuels burned in the Primary Reformer that generate NO_x emissions and identification of any potential methods, procedures, work practices, techniques, controls, etc., that are available for the reduction/minimization of such fuel components.
- 5) Based on the findings in Item Nos. 1 through 4, implementation of economically feasible control options to attain best achievable NO_x emissions reductions.
- 6) Conducting all testing necessary to support the BACT analysis and to quantify emissions during any set of operational conditions including variations in fuel, and adequate to categorize increases in NO_x emissions above the current BACT limit as thermal NO_x, fuel NO_x or prompt NO_x.
- 7) An analysis of add-on controls used in other industries to reduce NO_x emissions, for example but not limited to, Selective Catalytic Reduction and Non-Selective Catalytic Reduction, as well as methods of lowering exhaust temperatures to reduce thermal NO_x emissions.
- 8) Submittal of bi-monthly progress reports during the BACT analysis.
- 9) Within 60 days of the termination of the one-year BACT analysis, submit an application for a permit which will include the final BACT analysis BACT limit, and an analysis indicating if any other pollutant is affected by this final determination.
- 10) Include with the application, an assessment of CAM and if needed, a CAM Plan.

- 11) Review the impacts of secondary formation of $PM_{2.5}$ resulting from the increase in NO_X emissions.

#1 and #3 Nitric Acid Plants - Carbon Monoxide (CO)

Step 1: Identify All Control Technologies

A search of the RBLC was conducted to identify technologies for the control of carbon monoxide emissions from nitric acid plants. There was a single entry for CO emissions at nitric acid plants. The facility (PCS Nitrogen Fertilizer located in Augusta, Georgia) operates a 1,300 ton per day nitric acid plant and utilizes a catalytic combustion device to control NO_X emissions. The CO emissions that result from the device are limited to 30 lb/ton of acid produced. There are no control devices listed for CO emissions. On typical natural gas combustion devices, a regenerative thermal oxidizer (RTO) is an option for reducing CO emissions, in that the emissions are converted to CO_2 . The most prevalent method of control for CO emissions is to properly design and operate the combustion device.

Step 2: Eliminate Technically Infeasible Options

While it is technically feasible to install a RTO to control CO emissions at a combustion device, one has never been installed specifically on a nitric acid plant. Additionally, due to the low amount of CO emissions at the #1 and #3 Nitric Acid Plants (14.6 tpy and 11.0 tpy, respectively), the cost to design and install two separate RTO units at an approximate cost of \$4,000,000 per unit is not feasible.

Step 3: Rank Remaining Control Technologies by Control Effectiveness

The most feasible and effective control of CO emissions at the nitric acid plants is proper operation of the NSCR devices. As stated previously, CO emissions from the units tend to increase in the ratio of fuel gas to oxygen and NO_X going to the combustor. Proper operation of the NSCR devices is indicated by the R-factor, which is the ratio of the actual amount of fuel gas feed to the combustor versus the stoichiometric amount of fuel gas needed to reduce the NO_X to water and elemental nitrogen. The goal is to keep the R-factor as close to one as possible. If the factor is less than one, then unreacted NO_X can leave the system and can cause non-compliance with the facility's short-term limits. A very high R-factor can drive NO_X emissions down; however, this condition indicates that too much fuel gas is being fed to the combustor. This can result in higher than necessary CO emissions and wasted fuel gas.

Step 4: Evaluate Most Effective Controls and Document Results

Proper operation of the NSCR device is the most effective control for CO emissions at the nitric acid plants.

Step 5: Select BACT

Based on the low rate of emissions and the high cost of installing two separate control devices for CO emissions, proper operation of the fumeabator units is selected as BACT to control the emissions of carbon monoxide.

B. Modeling SummaryAmmonia Plant #4 Primary Reformer – NO_x Emissions**List of Emissions and Stack Parameters**

Between the time of the submittal of PCC's initial construction application and the current submittal, the Environmental Protection Agency (EPA) issued a new federal 1-hour National Ambient Air Quality Standard (NAAQS) for NO₂. Due to challenges that the new standard presents for facilities with significant levels of NO_x emissions, it has become necessary to utilize the tiered screening methods in conducting ambient air impact analyses that the EPA allows for in their Guideline on Air Quality Models. The tiered modeling methods consider the amount of NO₂ in the overall NO_x release and/or the conversion of NO to NO₂ in the ambient air. More specifically, the Tier 1 methodology assumes a total conversion of NO to NO₂, while the Tier 2 methodology assumes that only 80% of the NO released is converted to NO₂, which is the annual national default value. The Tier 3 methodology allows for a detailed case-by-case analysis of the sources at the facility, which may include the site specific in-stack NO₂/NO_x ratios at each source. The use of a Tier 3 methodology, because it is case-by-case, requires approval by the EPA before it can be used in an ambient air impact analysis. Prior to the promulgation of the 1-hour NAAQS for NO₂, the use of the Tier 2 method typically provided an adequate adjustment, or reduction in NO₂ emissions, such that modeling results were below the annual NAAQS for NO₂. However, with the introduction of the 1-hour NO₂ standard, it has become necessary to consider a Tier 3 method as an option in demonstrating compliance with the NAAQS. PCC has examined the NO₂/NO_x ratios at the sources that are currently operating and has utilized the Plume Volume Molar Ratio Method (PVMRM) for this modeling analysis.

The following table provides the PCC sources that were included in the NO₂ modeling analyses, as well as the requested NO₂/NO_x ratios that were used (i.e., as obtained from PCC personnel).

Emission Source	Requested NO_x Emission Rate (lb/hr)	In-Stack NO₂/NO_x Ratio
Ammonia Plant #4	33.75	0.15
Nitric Acid Plant #1	30.0*	0.20
Nitric Acid Plant #3	22.5*	0.20
Nitric Acid Plant #4	50.1*	0.20
Nitric Acid #1 Preheater	0.98	0.10
Nitric Acid #3 Preheater	0.98	0.10

Emission Source	Requested NO_x Emission Rate (lb/hr)	In-Stack NO₂/NO_x Ratio
Nitric Acid #4 Preheater	0.98	0.10
NA #4 SCR Preheater	1.47	0.10
Boiler #1	2.60	0.10
Boiler #2	3.92	0.10

*Hourly emission rate based on proposed maximum ton/hr acid production rate and 3.0 lb/hr, 7-day average limit in Construction Permit No. 2008-100-C.

Models Utilized

For the NO_x modeling analysis at PCC, AERMOD was used to estimate the maximum ground level concentrations. Specifically, Lakes AERMOD View (i.e., Version 6.7.1) was used in modeling all pollutants at all averaging times. Because this is a revised analysis, two model scenarios have been included. Both analyses utilized the emission rates outlined in the table above. The first analysis was compared to the annual NO_x significance level to determine if additional NAAQS or PSD Increment modeling is required. The second modeling analysis was evaluated against the new 1-hour NAAQS standard for NO₂. For each of these modeling analyses, an updated five year meteorological data set was used, which includes data from 2006 through 2010 for Tulsa, Oklahoma.

Air Quality Monitoring

The applicant did not anticipate that any on-site air quality monitoring will be required prior to facility operation. Standardized rural background data was used for the NAAQS analysis as provided by the ODEQ.

Receptors

For the investigation, the significance analysis consisted of receptors placed along the property boundary along with a fine grid with receptors spaced at 100 meters extending out approximately two kilometers, a spacing of 250 meters out to 4 kilometers, a spacing of 500 meters out to 6 kilometers and a spacing of 1 kilometer out to 15 kilometers. The NAAQS and PSD Increment modeling analysis utilizes a discrete property boundary grid and a similar grid described above. The magnitude of the grid was determined by the area of impact radius that was determined in the significance analysis.

Building Wake Effects

Each of the sources included in the model were evaluated in terms of their relation to nearby structures. Predominant structures at the facility were included as buildings in the model and building downwash was integrated into the analysis. The U.S. EPA Building Point Input Program (BPIP) was used to determine the direction specific downwash dimensions.

Area Impact Visibility Analysis

As instructed in the ODEQ's Air Dispersion Modeling Guidelines, PCC utilized VISCREEN to address the visibility impacts of the sources at the facility. However, there are no Class II "sensitive areas" located within 40 kilometers of PCC that would otherwise require consideration of the sensitive area boundaries.

Summary of NO_x Significance Modeling Results

The net emissions increase of NO_x at PCC was modeled at an annual and 1-hour averaging period. The following results were obtained from the significance modeling for NO_x.

NO _x Significance Modeling Results				
Year	Averaging Period	Maximum Concentration (µg/m ³)	Area of Impact Radius (km)	Modeling Significance Level (µg/m ³)
2006	Annual	5.6	4.2	1
2007		5.7	3.5	
2008		6.0	4.1	
2009		5.3	3.5	
2010		6.3	3.5	

The results indicate that the maximum annual average ground level NO_x concentrations exceed the modeling significance levels. As a result, a full modeling analysis is required for NO_x.

For the short term 1-hour modeling analysis, the results were based on the average of the annual 98th percentile one hour daily maximum concentrations. This result was calculated within the AERMOD software and was based on a 5-year meteorological data set from 2006 through 2010. The result for PCC, based on the emission rates outlined in Section 2, was 85.8 µg/m³, which exceeds the interim significance level of 7.5 µg/m³ (4 ppb). Therefore, a NAAQS analysis was conducted for the 1-hour standard.

NO_x NAAQS Modeling Summary

Due to the significance analysis results, the NO_x emissions at PCC, as well as the surrounding facilities, were modeled at an annual and 1-hour averaging period. The following results were obtained from the significance modeling for NO_x.

NO _x NAAQS Modeling Results					
Year	Averaging Period	Maximum Concentration (µg/m ³)	Contribution from PCC at Maximum Location (µg/m ³)	Background Concentration (µg/m ³)	NAAQS (µg/m ³)
2006	Annual	18.3	0.4	8	100
2007		18.2	0.4		
2008		20.8	0.6		
2009		18.4	0.7		

Year	Averaging Period	Maximum Concentration ($\mu\text{g}/\text{m}^3$)	Contribution from PCC at Maximum Location ($\mu\text{g}/\text{m}^3$)	Background Concentration ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)
2010		20.0	0.4		

The results indicate that the maximum annual average ground level NO_x concentrations are below the NAAQS for NO_x emissions. The maximum contribution from PCC at the location of the highest result is minimal.

In addition to the analysis comparing to the annual standard, modeling was conducted to obtain the annual 98th percentile one hour daily maximum concentrations, which were then compared to the NAAQS 1-hour standard of $188.0 \mu\text{g}/\text{m}^3$. The result of the model was a maximum ground level concentration of $236.6 \mu\text{g}/\text{m}^3$, which after including a background concentration of $20.8 \mu\text{g}/\text{m}^3$ results in a total concentration of $257.4 \mu\text{g}/\text{m}^3$.

AERMOD was then used to calculate the contribution of PCC sources to all of the violations of the NAAQS using the MAXDCONT function from the highest 8th high to the highest 25th high. It was determined that there were no more violation of the NAAQS after the highest 20th high and that the PCC sources did not cause or contribute to the potential violations of the NAAQS. Impacts from the PCC sources were below the interim significance level of $7.5 \mu\text{g}/\text{m}^3$ at all times and locations where there was a potential NAAQS exceedance.

NO_x PSD Increment Modeling Summary

Due to the significance analysis results, the NO_x emissions at PCC, as well as those at the surrounding facilities, were modeled at an annual averaging period. Because the NAAQS modeling results are below the $25 \mu\text{g}/\text{m}^3$ Increment Limit for each of the five years, it was not necessary to conduct an increment analysis to reduce the model inputs and thus reduce the modeling results. The maximum NAAQS result before background included for NO_x was $20.8 \mu\text{g}/\text{m}^3$, and this included all existing sources within and surrounding the facility at maximum permitted emission rates. The following table contains the results of the NAAQS analysis in comparison to the PSD Increment levels.

NO_x PSD Increment Modeling Results

Year	Averaging Period	Maximum Concentration ($\mu\text{g}/\text{m}^3$)	Contribution from PCC at Maximum Location ($\mu\text{g}/\text{m}^3$)	PSD Increment ($\mu\text{g}/\text{m}^3$)
2006	Annual	18.3	0.4	25
2007		18.2	0.4	
2008		20.8	0.6	
2009		18.4	0.7	
2010		20.0	0.4	

The results indicate that the proposed permit change at PCC does not result in an exceedance in the consumption of the PSD Increment.

#1 and #3 Nitric Acid Plants - Carbon Monoxide (CO)**List of Emissions and Stack Parameters**

All of the sources listed in the following emission rate table, both existing sources and idle sources, were included in the modeling analysis. Note that the idled sources are the subject of another permit and will not be in operation until that permit has been issued.

Source ID	Stack Height	Temp.	Exit Velocity	Exhaust Rate	Stack Dia.	Other
	(ft)	(°F)	(fps)	(ft ³ /min)	(ft)	(lb/hr)
Existing Sources						
Boiler #1	25.0	400	20.01	3,777	2.0	4.36
Boiler #2	32.0	610	25.49	7,469	2.5	6.59
Granulator Scrubber #2	24.0	80	31.99	7,951	2.3	0.00
Granulator Scrubber #3	24.0	80	31.99	7,951	2.3	0.00
Granulator Scrubber #1	46.0	148	31.99	9,372	2.5	0.00
Ammonia Plant #4	70.0	360	45.01	69,924	5.7	18.60
Nitric Acid Plant #3	40.0	550	54.99	16,110	2.5	3.00
Nitric Acid Plant #4	74.0	550	104.49	30,615	2.5	0.00
Nitric Acid Plant #1	63.0	550	54.99	16,110	2.5	4.00
Nitric Acid Preheater #1	30.0	400	10.01	1,889	2.0	1.65
Nitric Acid Preheater #3	30.0	400	10.01	1,889	2.0	1.65
Ammonium Nitrate Plant #1	35.0	125	14.99	402	0.8	0.00
SCR Heater - Nitric Acid Plant #4	30.0	400	10.01	1,889	2.0	0.00
Ammonium Nitrate Plant #2	35.0	125	14.99	402	0.8	0.00
Cooling Tower #2	35.0	80	20.01	848,044	30.0	0.00
Cooling Tower #1	35.0	80	20.01	848,044	30.0	0.00
Carbon Dioxide Vent (Ammonia Plant #4)	35.0	40	60.01	45,303	4.0	4.00
Flare Pilot	60.0	1,600	60.01	25,205	3.0	0.00
Idled Sources						
Nitric Acid Preheater #4	30.0	400	10.01	1,889	2.0	1.65
Ammonia Plant #1	34.0	445	54.92	14,846	2.4	7.30
Ammonia Plant #3	29.6	470	55.84	16,360	2.5	7.70
Carbon Dioxide Vent	55.0	120	918.01	10,477	0.5	4.60
Carbon Dioxide Vent	55.0	120	112.01	1,278	0.5	0.60

Models Utilized

For the CO modeling analysis at PCC, AERMOD was used to estimate the maximum ground level concentrations. Specifically, Lakes AERMOD View (i.e., Version 6.7.1) was used in modeling all pollutants at all averaging times. For each the modeling analyses, an updated five

year meteorological data set was used, which includes data from 2006 through 2010 for Tulsa, Oklahoma.

Air Quality Monitoring

The applicant did not anticipate that any on-site air quality monitoring will be required prior to facility operation. Standardized rural background data was used for the NAAQS analysis as provided by the ODEQ.

Receptors

For the investigation, the significance analysis consisted of receptors placed along the property boundary along with a fine grid with receptors spaced at 100 kilometers extending out approximately two kilometers, a spacing of 250 kilometers out to 4 kilometers, a spacing of 500 kilometers out to 6 kilometers and a spacing of 1 kilometer out to 15 kilometers. The NAAQS and PSD Increment modeling analysis utilizes a discrete property boundary grid and a similar grid described above. The magnitude of the grid was determined by the area of impact radius that was determined in the significance analysis.

Building Wake Effects

Each of the sources included in the model were evaluated in terms of their relation to nearby structures. Predominant structures at the facility were included as buildings in the model and building downwash was integrated into the analysis. The U.S. EPA Building Point Input Program (BPIP) was used to determine the direction specific downwash dimensions.

Area Impact Visibility Analysis

As instructed in ODEQ's Air Dispersion Modeling Guidelines, PCC utilized VISCREEN to address the visibility impacts of the sources at the facility. However, there are no Class II "sensitive areas" located within 40 kilometers of PCC that would otherwise require consideration of the sensitive area boundaries.

Summary of Modeling Results

CO Modeling Summary

The net emissions increase of CO at PCC was modeled for both 8-hour and 1-hour averaging periods. The following results were obtained from the significance modeling for CO.

CO Significance Modeling Results

Year	Averaging Period	Maximum Concentration ($\mu\text{g}/\text{m}^3$)	Area of Impact Radius (km)	Modeling Significance Level ($\mu\text{g}/\text{m}^3$)
2006	1-hour	358.4	-	2,000
2007		354.1	-	

Year	Averaging Period	Maximum Concentration ($\mu\text{g}/\text{m}^3$)	Area of Impact Radius (km)	Modeling Significance Level ($\mu\text{g}/\text{m}^3$)
2008		412.6	-	
2009		370.5	-	
2010		344.9	-	

Year	Averaging Period	Maximum Concentration ($\mu\text{g}/\text{m}^3$)	Area of Impact Radius (km)	Modeling Significance Level ($\mu\text{g}/\text{m}^3$)
2006	8-hour	130.1	-	500
2007		111.4	-	
2008		127.6	-	
2009		132.8	-	
2010		137.5	-	

The results indicate that the maximum 8-hour and 1-hour average ground level CO concentrations do not exceed the modeling significance levels. Therefore, a full modeling analysis is not required for CO.

SECTION VII. COMPLIANCE ASSURANCE MONITORING EVALUATION

Background

Compliance Assurance Monitoring (CAM) applies to any pollutant-specific emissions unit at a major source that is required to obtain an operating permit, for any application for an initial operating permit submitted after April 18, 1998, that addresses “large emissions units,” or any application that addresses “large emissions units” as a significant modification to an operating permit, or for any application for renewal of an operating permit, if the emissions unit meets all of the following criteria.

- It is subject to an emission limit or standard for an applicable regulated air pollutant
- It uses a control device to achieve compliance with the applicable emission limit or standard
- It has potential emissions, after the control device, of the applicable regulated air pollutant of 100 TPY or 10/25 TPY of a HAP

Compliance Assurance monitoring will be addressed in the application for the operating permit. Everything else addressed in this section is the same as in Permit No. 2008-100-C (PSD) and is not repeated here.

SECTION VIII. OKLAHOMA AIR POLLUTION CONTROL RULES

OAC 252:100-1 (General Provisions)

[Applicable]

Subchapter 1 includes definitions but there are no regulatory requirements.

OAC 252:100-2 (Incorporation by Reference) [Applicable]

This subchapter incorporates by reference applicable provisions of Title 40 of the Code of Federal Regulations listed in OAC 252:100, Appendix Q. These requirements are addressed in the “Federal Regulations” section.

OAC 252:100-3 (Air Quality Standards and Increments) [Applicable]

Subchapter 3 enumerates the primary and secondary ambient air quality standards and the significant deterioration increments. At this time, all of Oklahoma is in “attainment” of these standards.

OAC 252:100-5 (Registration, Emissions Inventory and Annual Operating Fees) [Applicable]

Subchapter 5 requires sources of air contaminants to register with Air Quality, file emission inventories annually, and pay annual operating fees based upon total annual emissions of regulated pollutants. Required annual information (Turn-Around Document) shall be provided to Air Quality.

OAC 252:100-8 (Permits for Part 70 Sources) [Applicable]

Part 5 includes the general administrative requirements for Part 70 permits. Any planned changes in the operation of the facility that result in emissions not authorized in the permit and that exceed the “Insignificant Activities” or “Trivial Activities” thresholds require prior notification to AQD and may require a permit modification. Insignificant activities refer to those individual emission units either listed in Appendix I or whose actual calendar year emissions do not exceed the following limits.

- 5 TPY of any one criteria pollutant
- 2 TPY of any one hazardous air pollutant (HAP) or 5 TPY of multiple HAP or 20% of any threshold less than 10 TPY for a HAP that the EPA may establish by rule

Emission limitations and operational requirements necessary to assure compliance with all applicable requirements for all sources are taken from the construction permit application, or are developed from the applicable requirement.

OAC 252:100-9 (Excess Emissions Reporting Requirements) [Applicable]

Except as provided in OAC 252:100-9-7(a)(1), the owner or operator of a source of excess emissions shall notify the Director as soon as possible, but no later than 4:30 p.m. the following working day of the first occurrence of excess emissions in each excess emissions event. No later than thirty (30) calendar days after the start of any excess emission event, the owner or operator of an air contaminant source from which excess emissions have occurred shall submit a report for each excess event describing the extent of the event and the actions taken by the owner or operator in response to this event. Request for affirmative defense, as described in OAC 252:100-9-8, shall be included in the excess emissions event report. Additional reporting may be required in the case of ongoing emission exceedances. In a letter dated September 3, 2010, Kendal Stegmann with ODEQ authorized PCC to report excess emissions associated with startup and shutdown of Nitric Acid Plant #4 on a quarterly basis. This alternative reporting allowance was extended plantwide by Ms. Stegmann in an email to PCC dated September 20, 2010.

OAC 252:100-13 (Open Burning)

[Applicable]

Open burning of refuse and other combustible material is prohibited except as authorized in the specific examples and under the conditions listed in this subchapter. The Ammonia Storage Flare Pilot Flare is an insignificant activity. The flare is smokeless.

OAC 252:100-19 (Particulate Matter (PM))

[Applicable]

Section 19-4 regulates emissions of PM from new and existing fuel-burning equipment, with emission limits based on maximum design heat input rating. Fuel-burning equipment is defined in OAC 252:100-19 as any internal combustion engine or gas turbine, or other combustion device used to convert the combustion of fuel into usable energy. Table 1.4-2 lists natural gas total PM emissions to be 7.6 lbs/million scf or about 0.0076 lbs/MMBTU, which is in compliance for all fuel burning units at the facility. The following table summarizes equipment subject to this rule, the Appendix C limits, and the potential emissions. As illustrated in the table, all emission units are in compliance with this rule.

Equipment	Maximum Heat Input (MMBTUH)	Appendix C Emission Limit (lbs/MMBTU)	Potential Emission Rate (lbs/MMBTU)
Ammonia Plant #4 Primary Reformer	225	0.29	0.0076
MMBTUH Nitric Acid Preheater #1	20	0.51	0.0076
MMBTUH Nitric Acid Preheater #3	20	0.51	0.0076
MMBTUH Nitric Acid Preheater #4	20	0.51	0.0076
MMBTUH Boiler #1	80	0.37	0.0076
MMBTUH Boiler #2	80	0.37	0.0076
MMBTUH Ammonia Storage Flare Pilot	0.0152	0.6	0.0076

Section 19-12 limits particulate emissions from emission points in an industrial process based on process weight rate, as specified in Appendix G. As shown in the following table, all emission points are in compliance with Subchapter 19.

EUG	Process Rate (TPH)	Appendix G Emission Limit (lbs/hr)	PTE (lbs/hr)
Granulator Scrubber #1	16.7	27.04	2.10
Granulator Scrubber #2	16.7	27.04	2.10
Granulator Scrubber #3	16.7	27.04	2.10
Cooling Tower #1	6,130	103.54	1.18
Cooling Tower #2	10,008	111.50	1.92

OAC 252:100-25 (Visible Emissions and Particulates)

[Applicable]

No discharge of greater than 20% opacity is allowed except for short-term occurrences that consist of not more than one six-minute period in any consecutive 60 minutes, not to exceed three such periods in any consecutive 24 hours. In no case shall the average of any six-minute period exceed 60% opacity. The permit will require the use of natural gas in the fuel-burning units and maintenance and monitoring of all other particulate-emitting units to ensure the opacity standard is met.

OAC 252:100-29 (Fugitive Dust)

[Applicable]

No person shall cause or permit the discharge of any visible fugitive dust emissions beyond the property line on which the emissions originated in such a manner as to damage or to interfere with the use of adjacent properties, or cause air quality standards to be exceeded, or to interfere with the maintenance of air quality standards. Most of the parking areas, unloading areas, and access areas are paved. Under normal operating conditions, this facility has negligible potential to violate this requirement; therefore it is not necessary to require specific precautions to be taken.

OAC 252:100-31 (Sulfur Compounds)

[Applicable]

Part 5 limits sulfur dioxide emissions from new fuel-burning equipment (constructed after July 1, 1972). For gaseous fuels the limit is 0.2 lb/MMBTU heat input averaged over 3 hours. All equipment at this facility is being treated as new for purposes of this permit evaluation. For all equipment at the facility except the primary reformer, the permit requires the use of pipeline natural gas having no more than 5 grains TRS/100 scf to ensure compliance with Subchapter 31. As discussed in the memorandum, the primary reformer burns waste gas containing waste sulfur (H_2S) from the Desulfurization Unit. Waste sulfur recovered from the Desulfurization Unit is simply the H_2S recovered from the natural gas used as a raw material in the ammonia production process. The total sulfur content burned in the reformer will be the sulfur in natural gas fuel required to supply 225 MMBTUH plus the sulfur waste gas recovered from Desulfurization Unit. Based on pipeline natural gas having no more than 5 grains TRS/100 scf at a heating value of 1,020 Btu/scf as the supply for both reformer fuel and the Desulfurization Unit, total sulfur dioxide emissions will average no greater than 1.36 lbs- SO_2 /hr, which equates to 0.006 lbs- SO_2 /MMBTU which is in compliance. At peak emissions, which would not likely span the three-hour averaging period, emissions would be 12.93 lbs- SO_2 /hr, which equates to 0.06 lbs- SO_2 /MMBTU, still well in compliance.

OAC 252:100-33 (Nitrogen Oxides)

[Applicable]

This subchapter limits new gas-fired fuel-burning equipment with rated heat input greater than or equal to 50 MMBTUH to emissions of 0.20 lbs of NO_x per MMBTU, three-hour average. The following table summarizes equipment subject to this rule and the potential emissions expressed in units of lbs/MMBtu. As illustrated in the table, all emission units are in compliance with this rule.

Fuel-Burning Equipment Rated at \geq 50 MMBTUH	Heat Input Rating (MMBTUH)	Emission Factor (lbs/MMBtu)	Source of Emission factor
Primary Reformer	225	0.12	Temporary Limit
Boiler #1 and #2	53 and 80	0.049 *	AP-42; Table 1.4-1 Low NO_x burners

* Based on AP-42 factor of 50 lbs/MMscf converted to lbs/scf using a GCV for natural gas of 1,020 Btu/scf.

OAC 252:100-35 (Carbon Monoxide)

[Not Applicable]

This subchapter affects gray iron cupolas, blast furnaces, basic oxygen furnaces, petroleum catalytic cracking units, and petroleum catalytic reforming units. It requires removal of 93% or more of CO by "complete secondary combustion" from new sources and also from existing sources located in or significantly impacting a non-attainment area for CO. There are no affected sources.

OAC 252:100-37 (Volatile Organic Compounds) [Applicable]

Part 3 requires storage tanks with a capacity of 400 gallons or more and storing a VOC with a vapor pressure greater than 1.5 psia to be equipped with a permanent submerged fill pipe or with an organic vapor recovery system. This facility has no fuel storage tanks.

Part 5 limits the VOC content of coating used in coating lines or operations. This facility will not normally conduct coating or painting operations except for routine maintenance of the facility and equipment, which is not an affected operation.

Part 7 requires fuel-burning equipment to be operated and maintained so as to minimize VOC emissions. Temperature and available air must be sufficient to provide essentially complete combustion. The following combustion equipment is subject to this rule and is designed to provide essentially complete combustion of organic materials.

EMISSION UNITS			
EU/EUG ID	Point ID	EU Name/Model	Construction Date
EUG 1		Ammonia Plant #4	
1	101	225 MMBTUH Ammonia Plant #4 Primary Reformer	1995
EUG 4		Nitric Acid Heaters	
4	401	20 MMBTUH Nitric Acid Preheater #1	1966
4	402	20 MMBTUH Nitric Acid Preheater #3	1966
4	403	20 MMBTUH Nitric Acid Preheater #4	1995
EUG 8		Boilers	
8	801	80 MMBTUH Boiler #1	1978
8	802	80 MMBTUH Boiler #2	1995
NA		Insignificant Sources	
NA	1001	0.0152 MMBTUH Ammonia Storage Flare Pilot	1996

Part 7 also regulates effluent water separators that receive water containing more than 200 gallons per day of VOC. There is no effluent water separator at this location.

OAC 252:100-40 (Control Of Emission Of Friable Asbestos) [Applicable]

This subchapter regulates the release of friable asbestos to the ambient air during demolition and renovation operations.

Section 40-5, in addition to the requirements set forth for the handling of asbestos found in 40 CFR Part 61, Subpart M, contains provisions for handling, containerizing, storing, transporting and disposal of friable asbestos during demolition or renovation operations as well as maintenance of existing asbestos. The facility is subject to this rule.

OAC 252:100-42 (Toxic Air Contaminants (TAC)) [Applicable]

This subchapter regulates toxic air contaminants (TAC) that are emitted into the ambient air in areas of concern (AOC). Any work practice, material substitution, or control equipment required by the Department prior to June 11, 2004 to control a TAC shall be retained, unless a modification is approved by the Director. Because no AOC has been designated, there are no specific requirements for this facility at this time.

OAC 252:100-43 (Testing, Monitoring, and Recordkeeping)

[Applicable]

This subchapter provides general requirements for testing, monitoring and recordkeeping and applies to any testing, monitoring or recordkeeping activity conducted at any stationary source. To determine compliance with emissions limitations or standards, the Air Quality Director may require the owner or operator of any source in the state of Oklahoma to install, maintain and operate monitoring equipment or to conduct tests, including stack tests, of the air contaminant source. All required testing must be conducted by methods approved by the Air Quality Director and under the direction of qualified personnel. A notice-of-intent to test and a testing protocol shall be submitted to Air Quality at least 30 days prior to any EPA Reference Method stack tests. Emissions and other data required to demonstrate compliance with any federal or state emission limit or standard, or any requirement set forth in a valid permit shall be recorded, maintained, and submitted as required by this subchapter, an applicable rule, or permit requirement. Data from any required testing or monitoring not conducted in accordance with the provisions of this subchapter shall be considered invalid. Nothing shall preclude the use, including the exclusive use, of any credible evidence or information relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed.

The following Oklahoma Air Pollution Control Rules are not applicable to this facility:

OAC 252:100-7	Permits for Minor Facilities	not in source category
OAC 252:100-11	Alternative Emissions Reduction	not requested
OAC 252:100-15	Mobile Sources	not in source category
OAC 252:100-17	Incinerators	not type of emission unit
OAC 252:100-23	Cotton Gins	not type of emission unit
OAC 252:100-24	PM from Grain, Feed, or Seed Operations	not in source category
OAC 252:100-39	Nonattainment Areas	not in subject area
OAC 252:100-47	Landfills	not in source category
40 CFR Part 72	Acid Rain	not in source category

SECTION IX. FEDERAL REGULATIONS

PSD, 40 CFR Part 52

[Applicable]

A full PSD (prevention of significant deterioration) analysis was completed for issuance of Permit No. 2008-100-C (PSD). An exceedance of the PSD limits triggered an analysis for the Ammonia Plant #4 Primary Reformer, which was discussed previously in this memorandum.

NSPS, 40 CFR Part 60

[Subpart Dc and Subpart G Applicable]

Subpart Dc, Small Industrial-Commercial-Institutional Steam Generating Units, affects steam generating units constructed after June 9, 1989, and with capacity between 10 and 100 MMBTUH. Boiler #1 was constructed prior to the effective date and is not subject to Subpart Dc. Boiler #2 is subject to the rule. Because Boiler #2 will not burn coal, oil, or wood fuels, the emissions standards of this subpart are not applicable. Only the recordkeeping and reporting requirements of 40 CFR 60.48c, as further described in 40 CFR 60.7, are applicable.

Subpart G, Standards of Performance for Nitric Acid Plants, affects any nitric acid production unit that commences construction or modification after August 17, 1971 and requires that no owner or operator shall cause to be discharged into the atmosphere from any affected facility any gases which contain nitrogen oxides, expressed as NO₂, in excess of 1.5 kg per metric ton of acid produced (3.0 lb per ton), the production being expressed as 100 percent nitric acid, and shall not exhibit 10 percent opacity, or greater. The application for Permit No. 2008-100-C (PSD) states that Nitric Acid Plant #1 and #3 were installed in 1966 and are not subject to Subpart G.

Plant #4 was constructed in Illinois in 1964 and relocated to the Wil-Gro facility in 1995. §60.14(e)(6) provides that the relocation or change in ownership of an existing facility is not by itself, considered a modification under this part. In an applicability determination issued by EPA on April 22, 2005 (Control No. 0700028), concerning relocation of an NSPS boiler constructed (manufactured) prior to the effective date and relocated after the effective date, EPA states "EPA agrees with the findings of ADEC, that Trident's Boiler #6 is not subject to Subpart Dc, provided that Trident's statements that the boiler has not been rebuilt, reconstructed, or modified since its original installation are accurate. If it is found that any modifications to Boiler # 6 are or have been made, that will invalidate this determination." Therefore, provided Nitric Acid Plant #4 was not rebuilt, reconstructed, or modified since its original installation date, then it is not subject to Subpart G.

Subparts K, Ka, Kb, Petroleum Liquids and VOL Storage Vessels. The 1,000-gallon gasoline storage tank at this facility is less than the storage capacity thresholds for these subparts and therefore is not affected facilities.

Subpart VV, Equipment Leaks of VOC in the Synthetic Organic Chemical Manufacturing Industry. The equipment is not in a SOCM plant.

NESHAP, 40 CFR Part 61

[Applicable]

Subpart M, National Emission Standard for Asbestos, The provisions of this subpart are applicable to those sources specified in §§61.142 through 61.151, 61.154, and 61.155. Specifically, §61.145, Standard for Demolition and Renovation, affects facilities where demolition or renovation occurs in the presence of asbestos. The facility has been in compliance with this rule to date.

NESHAP, 40 CFR Part 63

[Subpart CCCCCC Applicable]

Section 63.43 of Subpart B requires that any facility not included in a listed source category (or for which a standard has not been promulgated under Section 112c of the CAA prior to May 15, 2002) that constructs or reconstructs a major source of HAP after June 29, 1998, is subject to a case-by-case MACT determination. This "112g" MACT determination may be superseded by any subsequently promulgated MACT requirement promulgated under Section 112c of the CAA. This facility is not a major source of HAP. As stated earlier in this memorandum, the permittee will take an enforceable limit to maintain its status as a minor source of HAP emissions. Emissions and continued compliance will be verified with initial stack testing and parametric monitoring, respectively. Compliance with the minor source limit was demonstrated with the testing for methanol emissions done on the Condensate Steam Flash Drum.

Subpart Q, National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers, applies to all new and existing industrial process cooling towers that are operated with chromium-based water treatment chemicals and are either major sources or are integral parts of facilities that are major sources as defined in §63.401. The cooling towers do

not use any chromium-based water treatment chemicals and are therefore not subject to the requirements of this subpart.

Subpart FFFF (Miscellaneous Organic Chemical Manufacturing [MON]) affects miscellaneous organic chemical process manufacturing units (MCPU) that are major or are located at major sources, as major is defined in 40 CFR 63.2 and that satisfy each of three criteria: 1) The MCPU must manufacture certain organic chemicals as identified by a number of sub-criteria; 2) The MCPU processes, uses, or generates any of the organic HAP listed in section 112(b) of the CAA or hydrogen halide and halogen HAP, as defined in §63.2550; and 3) The MCPU may not be subject to any other MACT, except for process vents from batch operations within a chemical manufacturing process unit (CMPU), as identified §63.100(j)(4) in Subpart I.

This facility has a urea manufacturing plant, satisfying the first criterion. Urea ($\text{CO}(\text{NH}_2)_2$) is produced by combining ammonia (NH_3) with carbon dioxide (CO_2), but the urea plant itself does not process, use, or generate any of the organic HAPs listed in section 112(b). Production of urea requires ammonia, and the facility has an ammonia plant that provides ammonia. As discussed in the Process Description, ammonia production results in emissions of methanol, a 112(b)-listed organic HAP. However, on-site production of ammonia is not necessary to the manufacture of urea, so the ammonia production equipment is not considered to be part of “all equipment which collectively function to produce a product or isolated intermediate that are materials described in §63.2435(b)” as a MCPU, as defined in §63.2550. That definition also states that ancillary activities are not considered a process or part of any process. Criteria one and criteria two are not satisfied, therefore the urea plant is not subject to MON.

The ammonia plant meets criteria 2) and 3), but not 1) and is therefore not subject. There are no other emissions units at the facility subject to this rule.

Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial and Institutional Boilers and Process Heaters at major sources of HAPs. EPA has published various actions regarding implementation of this rule as detailed following:

- September 13, 2004 EPA promulgated standards for major sources
- June 19, 2007 US Court of Appeals for the district of Columbia vacated and remanded the standards
- March 21, 2011 EPA promulgated new standards
- May 18, 2011 EPA published notice of delay of the effective dates until judicial review or EPA reconsideration is completed, whichever is earlier

Section 112(j) of the Clean Air Act addresses situations where EPA has failed to promulgate a standard as required under 112(e) (1) and (3). 112(j) requires case-by-case MACT determination applications to be submitted to the permitting authority within specified time frames. Since 112(j) appears to only address situations where EPA has failed to promulgate standards and not situations in which complete rules are subsequently vacated, confusion existed as to the requirements for these sources. On March 30, 2010, EPA proposed a rule to amend 112(j) to clarify what applies under 112(j). In the proposed rule, EPA clarifies that the intent was that vacated sources should be treated similar to sources where EPA has failed to promulgate a standard. The rule, as proposed, will require case-by-case MACT applications to be submitted to the permitting authority within 90 days after promulgation of these amendments or by the date which the source's permitting authority requests such application. Final action on the amendment is scheduled for the fall of 2011. Compliance with this subpart will be determined based on the requirements of the amended 112(j).

Subpart CCCCCC, National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities. This subpart establishes national emission limitations and management practices for hazardous air pollutants (HAP) emitted from the loading of gasoline storage tanks at gasoline dispensing facilities (GDF). This subpart also establishes requirements to demonstrate compliance with the emission limitations and management practices. The affected source includes each gasoline cargo tank during the delivery of product to a GDF and each storage tank that is located at an area source. GDF having a monthly throughput of less than 10,000 gallons of gasoline must comply with the requirements in §63.11116. GDF having a monthly throughput of 10,000 gallons of gasoline or more must comply with the requirements in §63.11117. GDF having a monthly throughput of 100,000 gallons of gasoline or more must comply with the requirements in §63.11118.

The 1,000-gallon gasoline storage tank at PCC is subject to the applicable requirements of this rule as an existing GDF having a monthly throughput of less than 10,000 gallons of gasoline.

CAM, 40 CFR Part 64

[Applicable]

This part applies to any pollutant-specific emissions unit at a major source that is required to obtain an operating permit, for any application for an initial operating permit submitted after April 18, 1998, that addresses “large emissions units,” or any application that addresses “large emissions units” as a significant modification to an operating permit, or for any application for renewal of an operating permit, if it meets all of the following criteria.

- It is subject to an emission limit or standard for an applicable regulated air pollutant
- It uses a control device to achieve compliance with the applicable emission limit or standard
- It has potential emissions, prior to the control device, of the applicable regulated air pollutant of 100 TPY or 10/25 TPY of a HAP

Because the application for an initial operating permit will be received on or after April 18, 1998, the “large emissions units” are subject to CAM. Other emissions units having potential emissions of 100 TPY or greater, but only prior to the control device, would be subject to this rule upon permit renewal. However, the applicant has elected to accept CAM requirements on these emissions units for this permit to establish the required monitoring criteria. Based on this, the emissions having CAM requirements are listed in the following table. These emissions units are subject to permit limits for pollutants that must be controlled to maintain compliance with the NAAQS.

EU ID#	Point ID#	Source Description	Pollutant	Uncontrolled Emissions (ton/yr)	Control Efficiency (%)	Controlled Emissions (ton/yr)
3	301	Nitric Acid Plant #1	NO _x	913	94	58.4
3	302	Nitric Acid Plant #3	NO _x	684	94	43.8
3	303	Nitric Acid Plant #4	NO _x	3,198	95	159.7
7	701	Granulator Scrubber #1	PM	193	98.5	2.9
7	702	Granulator Scrubber #2	PM	193	98.5	2.9
7	703	Granulator Scrubber #3	PM	193	98.5	2.9

Monitoring of NO_x per the standards of NSPS Subpart G is considered presumptively acceptable monitoring for Nitric Acid Plants #1, #3, and #4, Point ID #301, #302, and #303, respectively, in accordance with 40 CFR 64.4(b)(4). The required explanation of the applicability is in the applicability discussion for NSPS Subpart G. For the Granulator Scrubbers, Point ID #701, #702, and #703, respectively, CAM will be monitoring the throughput, initial performance testing to correlate the PM limit to an opacity action level, and continued opacity measurements using EPA Method 9. CAM for the Ammonia Plant #4 Primary Reformer, if required based on the new BACT emissions limit to be determined, will be included in the operating permit.

Chemical Accident Prevention Provisions, 40 CFR Part 68 [Applicable]

This facility will not process or store more than the threshold quantity of any regulated substance (Section 112r of the Clean Air Act 1990 Amendments). The facility has one 396,800 gallon nitric acid storage tank, five 78,800 gallon ammonia storage tanks, and one 5,640,000 gallon ammonia storage tank. The ammonia tanks will be subject to this rule, and the facility will be required to have a risk management plan before storing the ammonia. More information on this federal program is available on the web page: www.epa.gov/ceppo.

Acid Rain, 40 CFR Part 72 (Permit Requirements) [Not Applicable]

This facility is not an affected source.

Stratospheric Ozone Protection, 40 CFR 82 [Not Applicable]

These standards require phase out of Class I & II substances and reductions of emissions of Class I & II substances to the lowest achievable level. This facility does not utilize any Class I & II substances.

SECTION X. COMPLIANCE

Tier Classification and Public Review

This application has been determined to be a Tier II based on the request for a construction permit modification considered significant under 252:100-8-7.2(b)(2) and which is not classified under Tier III. The applicant requested concurrent Public and EPA reviews.

PCC published a "Notice of Filing a Tier II Application" in *The Pryor Daily Times*, a daily newspaper published in the city of Pryor, Mayes County, on August 16, 2011. The notice stated that the application was available for public review at the Pryor Chemical Company office located at 4463 Hunt Street, Pryor, Oklahoma, or at the DEQ Air Quality Division's main office in Oklahoma City, and that a draft of this permit would be made available for public review for a period of 30 days as stated in a newspaper announcement. It also stated that any person(s) may request a meeting to explain the permitting process, and that such request must be submitted to the Air Quality Division contact in writing within 30 days of the publication of the notice. No comments or request for a process meeting were received.

PCC published a "Notice of II Draft Permit and Public Meeting" in *The Pryor Daily Times*, a daily newspaper published in the city of Pryor, Mayes County, on November 17, 2011. The

notice stated that the application was available for public review at the Pryor Public Library, 505 East Graham Avenue, Pryor, Oklahoma, or at the DEQ Air Quality Division's main office in Oklahoma City, and that this permit would be made available for public review for a period of 30 days from the date of the publication of the notice. It also stated that a public meeting was scheduled at Mid-America Expo Center, 526 Aspen Road, Pryor, Oklahoma on Tuesday December 20, 2011 at 6:00 PM and that comments could be submitted to the Air Quality Division during the comment period. No comments or request for a process meeting were received from public participants. EPA submitted comments dated December 22, 2011. DEQ submitted a response dated May 22, 2012 and received no additional comments or response from EPA.

This facility is not located within 50 miles of the border of Oklahoma and any other state. PCC has submitted an affidavit documenting that it is not seeking a permit for land use or for any operation upon land owned by others without their knowledge. The affidavit certifies that PCC owns the real property. Information on all permit actions is available for review by the public in the Air Quality section of the DEQ Web page: www.deq.state.ok.us/.

Fee Paid

Fee paid: \$1,500 for construction modification of a Part 70 source.

SECTION XI. COMMENTS ON DRAFT PERMIT

Comments were received from the EPA and from the applicant. Revisions to reflect lowering certain NO_x emissions limits to meet modeling requirements for the planned Idled Sources permit and other miscellaneous non-significant changes and corrections, including such as grammatical and rounding hourly emissions calculations to the nearest tenth to match the permit limits were submitted by the applicant (PCC).

A. Applicant Comments

- 1) Ammonia Plant #4, Primary Reformer – Various references throughout memo and permit. The applicant requested to lower the temporary, 1-year BACT limit for the Primary Reformer (Ammonia Plant #4) from 0.15 lbs/MMBtu to 0.12 lbs/MMBtu; 33.75 lbs/hr to 27.0 lbs/hr; 147.83 tons per year to 118.26 tons per year, to coincide with inputs used for air dispersion modeling submitted for the upcoming Idled Sources permit.

Response

Changes were made as requested.

- 2) Nitric Acid Plants #1 and #3 - Page 2 of memo, Item No. 9) of list of changes. Revise CO emissions from the Nitric Acid Plants to be consistent with permit limits as follows:
Nitric Acid Plant #1 – 4.0 lbs/hr (unchanged); 16.8 tons per year to 14.6 tons per year

Nitric Acid Plant #3 – 3.0 lbs/hr (unchanged); 12.6 tons per year to 11.0 tons per year

Response

Changes were made as requested.

- 3) Ammonia Plant #4, Condensate Steam Flash Drum. Increasing flash steam from 1,040 lbs/hr to 1,050 lbs/hr. The VOC limit for VOCs emitted from the steam are not changed.

Response

Changes were made as requested.

- 4) Urea Plant. Increasing maximum production capacity from 400 tons urea per day to 480 tons of urea per day, or 146,000 to 175,200 tons per year. The Urea Plant is a closed system and has essentially no emission.

Response

Changes were made as requested.

- 5) Nitric Acid Plants #1, #3, and #4 - Page 17 of memo, table illustration. Include 7-day average to illustrate maximum hourly value used in air dispersion modeling.

NO_x Emissions – Nitric Acid Plants #1, #3, #4

NO _x Emissions	Controlled NO _x Emissions Factor (lb/ton-100% HNO ₃)	Control Efficiency (%)	Nitric Acid Produced (ton/hr)	Controlled NO _x Emissions	
				lb/hr	ton/yr
Plant #1 – EU Point 301	1.6 ¹ (3.0) ²	90	10.0	16.0 ¹ (30.0) ²	58.4 ³
Plant #3 – EU Point 302	1.6 ¹ (3.0) ²	90	7.5	12.0 ¹ (21.8) ²	43.8 ³
Plant #4 – EU Point 303	2.5 ¹	95	16.7	41.75 ¹ (50.1) ²	159.7 ³

1 12-month rolling cumulative.

2 7-day average.

3 Requested enforceable limit.

Response

Changes were made as requested.

- 6) Revise the procedure for the one-year trial BACT analysis to coincide with the requirements specified in the permit under 'Compliance Schedule'.

Response

Changes were made as requested.

- 7) Ammonia plant #4, Primary Reformer, Specific Condition 1.A of permit. Revise limits to 0.12 lbs/MMBtu, 27.0 lbs/hr, and 118.3 tons per year NO_x.

Response

Changes were made as requested.

- 8) Ammonia plant #4, Primary Reformer, Specific Condition 1.A of permit. Correct reference to Specific Condition No. 6.C to read Specific Condition No. 7.C.

Response

Changes were made as requested.

- 9) Nitric Acid Preheaters #1, #3, and #4, Specific Condition 1.D of permit. Correct reference to Specific Condition No. 6.C to read Specific Condition No. 7.C.

Response

Changes were made as requested.

- 10) Carbon Dioxide Vent, Specific Condition 1.E of permit. Delete statement "Carbon dioxide is not a regulated pollutant at this time.

Response

Changes were made as requested.

11. Specific Condition No. 10. Revise the opening statement "Within 60 days of start-up, and at other such times as directed by the AQD, the permittee shall conduct performance testing as follows and furnish a written report to the AQD" to "Within 60 days after achieving the maximum production rate at which the source will be operated, but not later than 180 days after initial startup, and at other such times as directed by the AQD, the permittee shall conduct performance testing as follows and furnish a written report to the AQD."

Response

The language in the permit is taken from 40 FCR 60 Part A, which contains the provisions and procedures under which delays in testing can be approved. Therefore, no changes were made to this condition.

12. Compliance Schedule. Delete Condition 11 of the Compliance Schedule and augment Condition 10 of the Compliance Schedule with “and an analysis indicating if any other pollutant is affected by this final determination”.

Response

DEQ agrees with the modification to Condition 10 but not the deletion of Condition 11.

B. EPA Comments

ODEQ received comments concerning the Pryor Chemical Company, Permit No. 2008-100-C (M-1) (PSD), dated December 22, 2011. The following is a response to those comments.

To supplement these responses, ODEQ is making modeling files available through our FTP site. Included in the e-mail with this document will be the directions that will allow EPA access to these modeling files.

Aggregation Analysis for two applications

It is our understanding that ODEQ is currently working on a PSD permit application for Pryor Chemical to restart more equipment. This application was mailed to EPA Region 6 office on April 15th, 2011. It needs to be determined if modifications to current proposed permit No. 2008-100-C (M-1) (PSD) and an application for Pryor Chemical to restart more equipment (production units) should or should not be combined into a single application for PSD applicability and the PSD BACT analysis. Please provide an aggregation analysis to justify the appropriateness in treating each project as a separate PSD project and not as a single PSD project.

Be mindful of the EPA memo dated September 22, 2009, by which Gina McCarthy withdrew the January 12, 2007 guidance memorandum entitled “Source Determinations for Oil and Gas Industries”. The aggregation of facilities must be done in accordance with 40 CFR 52.21(b)(6) on a case by case basis. Permitting authorities shall rely on the three regulatory criteria for identifying emissions activities that belong to the same “building”, “structure”, “facility”, or “installation”. These are (1) whether the activities are under the control of the same person (or person under common control); (2) whether the activities are located on one or more contiguous or adjacent properties; and (3) whether the activities belong to the same industrial grouping.

Past guidance by the EPA on the emission unit aggregation in regards to multiple NSR/PSD projects occurring within a certain time frame at the same plant has been consistent, and it has been concluded that the construction and installation of emission units were treated as a single project. In a letter issued by the EPA Region V on March 16, 1992, the EPA provided guidance regarding NSR modifications at 3M facility located in Maplewood, Minnesota. The guidance

indicated that that even though the multiple minor permit modifications were approved by the state permitting agency, 3M's minor permit modifications at the plant over an eighteen (18) month period was considered a single major NSR modification. EPA Region V determined that 3M had circumvented the Prevention of Significant Deterioration (PSD) regulations through these small projects.

Understanding that the permit applications for proposed permit and Pryor Chemical to restart more equipment (production units) are major PSD and both subject to BACT, EPA requests that Pryor Chemical still provide an analysis to justify why these two projects should be considered separate and not as a single PSD project.

Response

EPA has requested clarification regarding how the two projects were treated with regard to aggregation and EPA regulatory requirements and corresponding policy.

With regard to the first part of the question and activities belonging to the same major source with regard to “building”, “structure”, “facility”, or “installation”, the facility is treated as a single facility, therefore, the only issue concerns project aggregation. ODEQ has completed an in-depth project aggregation of activities associated with Permit 2008-100-C PSD and 2008-100-C (M-2) PSD. It should be noted that changes proposed as part of 2008-100-C (M-1) PSD are adjustments to the original project and, as such, this permit is treated as a reopening of the original PSD permit.

With regard to the two projects, the original starting of the facility and the proposal to start additional equipment at the site, ODEQ completed a project aggregation analysis in the memorandum associated with 2008-100-C (M-2) PSD. That analysis is repeated here. PCC has submitted three different permit actions related to the re-starting of production equipment at the existing site. Following is ODEQ’s review of project aggregation.

Action	Date	Comment
PSD Construction Permit, 2008-100-C PSD	3/27/2008	Original construction permit to re-start portions of facility
2008-100-C PSD	2/23/2009	Permit Issued
PSD Construction Permit modification request, 2008-100-C (M-1) PSD	12/20/2010	Request to alter some equipment/permit conditions of the original PSD permit
PSD Construction Permit, 2008-100-C (M-2) PSD	4/6/2011	PSD Construction permit request to re-start additional equipment

ODEQ issued Permit No. 2008-100-C PSD to restart an out-of-service fertilizer manufacturing plant on February 23, 2009. All emissions units to be placed into service were treated as new sources and underwent a complete NSR/PSD review including modeling and BACT analysis. In 2010, PCC replaced burners in the Primary Reformer of Ammonia Plant #4 resulting in an increase in NO_x. In late 2010, PCC self-reported a significant increase in NO_x that exceeded the permit/BACT limits and subsequently submitted an application for a permit modification to address the increase in Permit No. 2008-100-C (M-1). PCC also included various “clean-up”

items related to the start-up. Since these items were essentially changes to the original project ODEQ considered this permit action a re-opening of the existing PSD permit and required PCC to re-evaluate all combined emissions for PSD purposes. Basically, the permit requests associated with Permit No. 2008-100-C (M-1) PSD were considered part of the original project to re-start the facility.

PCC submitted a PSD Construction Permit application (2008-100-C (M-2)) to re-start additional equipment on April 6, 2011. A review was completed to assure this proposal should not be aggregated with the original project. The major review items include project timing, company operational statements or intent, and funding. Information related to these items was requested from PCC. PCC provided statements on Security and Exchange Commission (SEC) quarterly and annual filings and conference call documents which state the intent to start only the equipment associated with the original permit. Also provided were Authorization of Expenditures (AFE's) which indicate approval dates of March, 2011 for the additional equipment associated with this permit action, 2008-100-C (M-2) PSD. Concerning project timing, the original permit application and this permit application were submitted approximately 3 years apart.

Based on the following information, ODEQ has determined that this project can be considered separate from the original PSD construction project:

1. Statements concerning SEC filings
2. AFE approvals
3. Project Timing

Air Modeling Analyses Comments/Concerns

Comment #1

It is unclear from the permit application submitted by Pryor Chemical Company and the draft/proposed permit memorandum what the total increases in NO_x emissions occurring as a result of the proposed project. Without this information, we are unable to determine if the NO_x emissions associated with the project trigger the PSD permitting requirement to conduct an ozone impacts analysis for the proposed project. Please provide information regarding the project increases of NO_x emissions. If the emissions increases exceed the threshold triggering an ozone impacts analysis, please provide additional information to demonstrate the facility's compliance with the ozone NAAQS.

Response

As indicated previously, this permit action is considered a re-opening of the existing PSD permit. Since NO_x emissions are being relaxed/increased, compliance requirements with the ozone standard should be reviewed since NO_x is now a trigger for ozone review.

Updates were submitted by the applicant during the public comment period for the (M-1) permit, PCC now proposes the one-year trial BACT Period limits of 0.12 lbs/MMBTU, 27.0 lbs/hr, and 118.3 tons per year for NO_x. This is an increase of 15.1 lbs/hr and 66.1 tons per year. The memo

and permit has been updated to reflect this new level. This results in a new total of 427.86 TPY ($361.76 + 66.1$ TPY) of NO_x.

Methods for evaluating single source impacts on ozone concentrations are not consistent, due to the lack of availability of data at a refined level, readily available tools and EPA guidance. DEQ has evaluated the impact of large emission increases from proposed projects using an existing air quality database generated for a SIP evaluation and the CAMx photochemical modeling system. DEQ conducted photochemical modeling for the neighboring Norit facility using the EAC modeling database (projected to 2007) and adding 529 tons per year of NO_x. Maximum impacts from the proposed increases at the Norit facility were insignificant. A maximum 8-hour increase of 0.49 to 0.5 ppb was predicted from the site. As emissions from this project for Pryor Chemical Company are nearly 20% lower than those of the Norit facility, DEQ determined that no further analyses were necessary.

Comment #2

The modeling protocol and modeling results summary report that were received by the EPA did not contain a description of the modeling analysis or modeling results for CO. However, the draft/proposed permit memorandum does contain results for CO significance modeling that was conducted for the proposed project. Please provide additional information regarding the source of the CO significance modeling information that is included in the draft/proposed permit memorandum.

Response

Modeling was conducted that resulted in impacts below the SIL. ODEQ cannot determine if CO modeling was included in modeling reviews submitted to EPA. ODEQ is forwarding to EPA modeling that was conducted and relied upon that demonstrates facility-wide emissions are below the SIL.

Comment #3

The 1-hour NO₂ modeling results submitted by the applicant in the June 24, 2011 modeling results summary report state that the PCC facility's contribution to the 98th percentile of the 1-hour daily maximum modeled concentration ($39.5 \mu\text{g}/\text{m}^3$) exceeds the 1-hour NO₂ interim SIL. However, the modeling results summary contained in the draft/proposed permit memorandum indicates that while exceedances of the 1-hour NO₂ NAAQS do occur in the model results, the facility's contribution to all modeled exceedances of the NAAQS is less than the SIL. Please provide additional information, including any additional/updated modeling to clarify the discrepancies between the applicant's submittal and the draft/proposed permit memorandum.

Response

ODEQ is unclear as to what applicant submittal resulted in a discrepancy. The applicant was required to conduct several modeling runs as a result of DEQ review. In order to clarify what modeling run was ultimately relied upon that demonstrates the facility had no exceedances of the

SIL at any of the modeled NAAQS violations, the NO_x modeling is being submitted with this response.

Comment #4

The 1-hour NO₂ modeling results summary report submitted by the applicant dated June 24, 2011 indicates that a background value of 33.1 µg/m³ was used in the analysis. However, the background monitored 1-hour NO₂ value included in the draft/proposed permit memorandum is 20.8 mg/m³. Please provide additional information to clarify the discrepancies between the applicant's submittal and the draft/proposed permit memorandum.

Response

The background data was based on the design values from the Cherokee Heights Monitor (40-097-9014) from 2007, 2008, and 2009. This monitor is located approximately 2.8 km southeast of the facility.

Comment #5

The draft/proposed permit memorandum indicates that five idled sources that are "subject of another permit" were included in the CO significance modeling analysis for the proposed project. Based on the emissions and process description information contained in the permit application, it is anticipated that at least some of this idled sources will also have NO_x emissions. It is not clear why these idled sources were included in the CO modeling but not in the NO₂ modeling analyses. The current permit record does not provide enough information to explain why the permit actions are considered separate projects or why the CO modeling would include emissions from both permit actions, if truly separate.

Response

The facility-wide CO modeling was relied on for convenience. The applicant was doing facility-wide modeling for NO_x so they just provided facility-wide CO modeling since it still demonstrated no significant impact.

Comment #6

The 1-hour and annual NO₂ NAAQS modeling analyses submitted by the applicant were conducted using the Tier 3 PVMRM approach. Since the use of PVMRM is a non-guideline technique, EPA Regional Office approval of an applicant's modeling protocol is required. Region 6 did receive a modeling protocol/analyses document from the applicant, which contained some of the modeling procedures that were followed in the modeling analyses summarized in the June 24, 2011 modeling results summary report, but some issues were not addressed.¹ The Region has the following comments/concerns regarding the PVMRM modeling approach utilized by the applicant:

¹ Modeling protocol referenced in this comment was dated May 20, 2011.

- a. The applicant utilized an equilibrium ratio of 0.75 in the 1-hour and annual NO₂ Tier 3 modeling analyses without providing justification for the use of this value instead of using the default equilibrium ratio value of 0.90. For a Tier 2 approach we allow use of the 0.75 for annual and 0.80 for 1-hour as the amount converted, but the equilibrium ratio is the ultimate end conversion ratio which is the end result of the conversion equation efficiency of converting NO to NO₂ at a distance further from the source than we are typically evaluating for Tier 2. The Tier 2 approach is focused on the highest modeled values, so we allow a lower conversion ratio to be used instead of the equilibrium ratio, since the Tier 2 approach is used closer to the modeled source. We have not approved a protocol for use of less than 0.90 equilibrium ratio, therefore justification should be provided or reconsideration of conducting the modeling with 0.90 equilibrium ratio.
- b. The applicant utilized in-stack ratios ranging from 0.10 to 0.20 for on-site emission sources, depending on source type. The applicant's submittals state that these in-stack ratio values were obtained from PCC personnel but do not provide documentation (e.g., stack test, monitoring data) to support the in-stack ratios used in the 1-hour and annual NO₂ Tier 3 modeling analyses. This information is necessary for review and conclusion that the proposed in-stack ratios are acceptable and protective of the NAAQS based on the modeling analysis.
- c. The applicant utilized in-stack ratios ranging from 0.10 to 0.30 for off-site inventory emission sources. The applicant's submittals do not provide justification for the use of these in-stack ratios for off-site sources instead of the generally accepted default in-stack ratio of 0.50 that was described in the March 3, 2011 EPA memo. Justification for lower than 0.50 in-stack ratios is necessary for approval of the modeling. Stack testing data or other analyses are necessary to support these in-stack ratios for each source and should be included as part of the PVMRM protocol for EPA and ODEQ to review.
- d. The protocol does not provide information regarding the source/basis of the background ozone value (single value of 0.03607 ppm) utilized in the 1-hour NO₂ and annual Tier 3 modeling analyses. Without this information, we are unable to determine the appropriateness of the ozone background value utilized in the modeling analyses. This is a very low background ozone value, and we have not approved using such a low value in PVMRM modeling in other analyses. Please provide additional information on this issue. In this situation, we would normally recommend using an ozone monitor nearby to get daily and temporal varying data for the 5 years modeled.

Response a.

The final review required use of the 0.90 equilibrium ratio value. Please see final modeling.

Responses to b. and c.

The company has tested and will be required to test the sources with in-stack ratios less than 0.2.

Even though in the recent guidance EPA “recommends” “general acceptance of 0.50 as a default in-stack ratio,” AQD feels that 0.5 is overly conservative for all sources and that 0.2 is adequately conservative to be applied to 100% of all nearby sources as a default in-stack ratio and is justified based on the available in-stack data.

Even if a few sources did have an in-stack ratio higher than 0.20 in-stack ratios, the average in-stack ratio of all sources would be well under 0.2. There is a significant amount of conservatism in modeling reviews using PVMRM. PMVMR requires use of a highly conservative ambient equilibrium ratio of 0.9, a conservative ozone concentration based on the maximum monitored values, added nearby background data (design value) that represents impacts from area sources that were not modeled and nearby sources that were included in the model (double counting), and what AQD has determined is a conservative estimate of the average in-stack ratio of 0.2.

During review of nearby source data to provide to the applicant, AQD determined that use of a value of 0.10 for all small (<100 MMBTUH) prepackaged boilers (based on limited test data) and a value of 0.15 for the nearby turbines controlled with SCR (based on review of recent stack test) was appropriate.

Response d.

A single value was not used, please see final modeling.

The ozone data file was developed and provided by the AQD to the applicant. It consisted of the maximum hourly values for 2006 to 2010 from the following monitors:

Tulsa (40-143-1127)
Skiatook (40-143-0137)
Mannford (40-143-0177)
Glenpool (40-143-0174)

General Comments/Concerns

Comment #1

- a) 40 CFR 98.2(a)(1) refers to Table A-3 that specifies facilities which are subject to GHG reporting after 2010. Table A-3 lists the source category of “Ammonia manufacturing” under Subpart G. Subpart G § 98.70(a) defines this source category as “Ammonia manufacturing processes in which ammonia is manufactured from a fossil-based feedstock produced via steam reforming of a hydrocarbon.” Draft/Proposed Permit page 1/83 states that “Certain increases in emissions are the result of increasing the permitted throughput limit for Ammonia Plant #4 from 700 tons per day to 770 tons per day..... Among those changes, a burner replacement triggered the requirements for PSD (Prevention of Significant Deterioration) analysis and a construction modification permit.” Draft/Proposed Permit page 7/83 states that “After desulfurization, the natural gas feed is mixed with the steam and the mixture is sent to the primary reformer.”
 - i) The quoted regulation is therefore applicable to PCC and renders it liable to GHG reporting.

- ii) Reference Appendix D of the EPA Publication “PSD and Title V Permitting guidance for GHG” of March 2011, the fact that the change triggered the requirement for a PSD permit renders PCC liable to GHG reporting.

Response

ODEQ is somewhat confused as to the intent of the question. GHG reporting under Subpart G and PSD permitting under the Tailoring and ODEQ rules are independent requirements. The intent of this document and review are to address PSD and ODEQ permitting issues. However, for completeness ODEQ will address both issues.

Part 98 is an EPA program that requires reporting GHG for certain sources directly to EPA. PCC submitted 2010 reporting year GHG reports for the subject plant in 2011 in compliance with the GHG reporting deadline.

With regard to permitting, a site specific BACT limit for the Primary Reformer did not occur due to a physical modification resulting in a significant emissions increase. The unit was probably unable to meet the BACT limit prior to the burner replacement. The burner replacement was considered a change to the original design and a more conservative approach was taken by subjecting the unit to a new BACT review and requiring the facility to conduct a facility-wide NO_x NAAQS review.

Regarding GHG, the original permit did not require GHG to be reviewed based on regulations at that time. Therefore, a GHG review is not as straight forward. A review of the GHG increases as a result of baseline to PTE, result in an increase less than half of the PSD significance level of 75,000 TPY. Based on this, ODEQ does not believe a GHG review is warranted based on permit reopening guidance/policies.

Additionally, while it is stated that the burners were replaced the actual heat capacity that was reviewed did not change. It was assumed in the first permit that the unit could reach 225 MMBtu/hr. This is the same capacity for which the unit is being permitted.

It should be noted that ODEQ made these decisions based on the EPA guidance found in the July 5, 1985, memo Permit Modifications and Extensions.

Comment #2

- b) On Draft/Proposed Permit page 4/83, the maximum heat input rating of the Primary Reformer in Ammonia Plant #4 is given as 225 MMBtu/hour. The heat output ratings of the burner that was replaced and the burner that replaced it are necessary to evaluate the cause for the increase in throughput of the Primary Reformer in Ammonia Plant #4 from 700 tpd to 770 tpd. Please provide additional information to clarify.

Response

As indicated in the response to Comment #1, the unit was originally permitted at 225 MMBtu/hr. The only PTE emission change was a result of the NO_x issue. A full PSD review for NO_x was conducted as a result of the reopening. Not even considering past actual, PTE emissions for the other pollutants from the unit are below PSD significance levels except for GHG. GHG considerations are addressed in the response to Comment #1. Based on this ODEQ believes a complete and conservative review has been completed.

Comment #3

- c) Draft/Proposed Permit page 7/83, Ammonia Plant #4 operates at a maximum capacity rate of 770 tons of ammonia per day, or 281,050 tons per year. On Draft/Proposed Permit page 4/83, The maximum heat input rating of the Primary Reformer in Ammonia Plant #4 is given as 225 MMBtu/hour. Draft/Proposed Permit page 12/83, Operating 8,760 hours annually equates to a fuel demand of 1,971,000 MMBtu/year. NO_x emissions were based on the burner manufacturer's guarantee of 0.053 lbs-NO_x/MMBtu. The NO_x emissions work out to 52.2 tpy. However, as noted in the introduction, this was increased to 0.059 lbs-NO_x/MMBtu when PPC changed out the burners. Then the NO_x emissions work out to 58.1 tpy. Pryor discovered that even that limit cannot be met and is requesting a trial BACT limit of 0.15 lbs-NO_x/MMBtu. The NO_x emissions then work out to 147.8 tpy resulting in an increase of 95.6 tpy from the permitted. This is greater than 40 tpy and is therefore a PSD Significant emission increase. 40 CFR 51.166 (b)(2)(i) states that a "Major Modification means any physical change in or change in the method of operation of a major stationary source that would result in a significant emission increase ...", Pursuant to this clause, provide supporting evidence to show that the modification carried out to increase the throughput of the Ammonia Plant #4 from 700 tpd to 770 tpd is not a Major Modification.

Response

As indicated in the response to Comments #1 and #2, this was considered a reopening that subjected the unit to a new BACT review and facility-wide NO_x NAAQS review. Again, a conservative approach was taken.

Comment #4

- d) 40 CFR 51.166 (a)(7)(iii) states that "Nomajor modificationshall begin actual constructionwithout a permitthat statesthat themajor modification will meet those requirements." PCC has carried out a Major modification unless supporting evidence to its contrary is provided. ODEQ has ratified the Major modification and [PDF page 5/83] has revised the applicant's proposed trial BACT analysis. Please provide supporting evidence for ratifying the Major Modification carried out by PCC without a PSD Permit.

Response

As indicated in previous responses, this change was considered a reopening. Policies and procedures were followed based on EPA guidance for modifying a PSD permit. EPA clearly acknowledges changes to original designs can happen and provided guidance for addressing these with regard to PSD permitting. In either case, a full review for the pollutant of concern was conducted. ODEQ enforcement review is on-going as a result of the burner/BACT issue.

Comment #5

- e) On Draft/Proposed Permit page 2/83, item 2 requires the establishment of a 1 year trial BACT limit on NO_x emissions from Ammonia Plant #4 Primary Reformer. 40 CFR 51.166(b)(12) defines BACT as *Best Available Control Technology means an emission limitationwhich would be emitted from any **proposed**major modification*. There is no provision to grant a trial BACT limit in this regulation for a plant that is in operation. Please quote the citation that grants the authority to provide a trial BACT limit.

Response

There is no specific citation that specifies a trial BACT period. However, EPA has determined where permitting authorities are faced with some uncertainty as to what emission limit was achievable the use of an adjustable limit, constrained by certain parameters and backed by worst case air quality modeling, is a reasonable approach. The uncertainty became evident when testing of the operating ammonia plant reformers were tested and no good existing BACT data related to these specific type of units was available or established. This process was found to be reasonable approach as determined by the Environmental Appeals Board of the United States Environmental Protection Agency in the AES Puerto Rico opinion decided May, 27, 1999 and in the Hadson Power decision (EAB 1992).

ODEQ believes the proposed BACT limit of 0.15 lb/mmbtu, on-going testing/unit evaluation, and the requirement to review all relevant data as part of a permit modification for possible adjustment of the BACT level is a reasonable approach. In addition, the proposed BACT emission level has demonstrated that the facility is in compliance with the NAAQS and increment under PSD.

As an update, the proposed BACT has been modified as a result of facility impacts and NAAQS compliance which was completed in 2008-100-C (M-2) PSD. This permit/memo has now been updated to reflect a BACT requirement of 0.12 lb/mmbtu.

Comment #6

- f) On Draft/Proposed Permit, page 24/83 lists EID # 103 Ammonia Plant #1 and EID # 105 Ammonia Plant # 3 as emitting 0.7 lb/hr each of PM. The Emissions Summary on Draft/Proposed Permit Page 23/83 does not include the other emissions from these plants. The process description on Draft/Proposed Permit pages 6/83 through 12/83 does not include a description of these plants. Differences in the process descriptions and the other emissions from these two plants should be included to facilitate the review. Please provide additional information to clarify.

Response

The inclusion of these estimates in this table was an error. These will be removed. These were not part of this permit review so no need to include elsewhere in this review.

Comment #7

- g) On Draft/Proposed Permit page 2/83, Index number 7 stated that the hourly emission rate of methanol from the Condensate Steam Flash Drum is to be increased to 3.86 lbs/hr to accommodate the increase of Ammonia production. The annual emission rate is being retained at 9.5 tpy to maintain minor source status for HAP and avoid MACT requirement. When the Flash Drum is operated with the hourly emission rate of 3.86 lbs/hr of methanol for 205 days, the annual emission of 9.5 tons would be reached. The method of maintaining the annual emission rate without cutting down the days of operation to 205 should be clearly explained.

Response

It is not uncommon for sources to increase short term limits while maintaining annual limits due to annual operating rates. The 205 day limit is based on the unit operating 24 hours a day. The unit could operate a standard of 5 days per week, 16 hours per day and still not reach the 9.5 TPY. It is reasonable to assume the unit can comply with the 9.5 TPY based on normal annual operating rates.

In either case, the permit provides for an annual limit of 9.5 TPY under Specific Condition 1. B., monitoring/testing of the condensate stream exhaust under Specific Condition #7, and record requirements under Specific Condition #12. These requirements will document compliance with the limit.

Comment #8

- h) On Draft/Proposed Permit page 2/83, Index number 8 refers to the “increase of hourly ratesfor the Nitric Acid Plants” and that “Nitric acid plant production limits have been removed as a limit considering that it has CEMS (continuous emissions monitoring)”. Please clarify which pollutants the CEMS would be measuring and how these measurements will monitor the Nitric Acid production to verify among others, the emissions per ton of acid guaranteed by plant manufacturers per Draft/Proposed Permit page 17/83.

Response

The CEMs will be measuring NOx emissions.

The CEMs measurements are integral to the emissions per ton limits contained in the permit. The CEMs themselves do not monitor Nitric Acid production. Specific Condition #12 requires the facility to track Nitric Acid production and Specific Condition #1 C. requires

both the emissions and Nitric Acid production to be utilized to demonstrate compliance with the lb/ton permit limits on a 12-month average and 7-day average for lb/ton and 12-month cumulative for TPY NO_x emissions.

Comment #9

- i) On Draft/Proposed Permit page 17/83 refers to the Nitric Acid Plants and states that “all calculations are based on continuous operation (8,760 hours annually)”. However the controlled NO_x emissions given in the table that follows give values that are less than if the plants operated continuously for 8,760 hours annually. The days required to operate the plant to achieve the annual emissions is shown in the table below. The method of reducing the annual emissions without cutting down the days of operation should be clearly explained.

Controlled NO_x emissions from Nitric Acid Plants

Plant #	lb/hr	tpy requested	Days required	tpy @ 8,760hrs
1 – EU 301	16.0	58.4	304.1	70.08
2 – EU 302	12.0	43.8	304.1	52.56
3 – EU 303	41.75	159.7	318.8	182.86
Total	69.75	261.9		305.505

Response

The permitting process can be used to limit the PTE of an emissions unit. For these units, emissions are a result of nitric acid production. The permit does not require the unit to operate at maximum short term production rates nor does it require the unit to operate 8,760 hours per year. Facilities commonly take limits below maximum annual operations as a result of known product demand, downtime, and for many other circumstances.

PCC has voluntarily limited their annual production based on the proposed limits. Monitoring, testing, and recordkeeping requirements will assure the units comply with the listed limits.

Comment #10

- j) On Draft/Proposed Permit page 2/83, Index number 9 is adding hourly and annual CO emission limits for Nitric Acid Plant #1 as 4.0 lbs/hr & 16.8 tpy and for Plant #3 quantified as 3.0 lbs/hr & 12.6 tpy respectively. PDF page 17/83 gives the “requested enforceable limit” for annual emissions of CO as 14.6 tpy and 11.0 tpy for plant #1 and #3 respectively. Questions that arise in this regard are as follows.

Response

Responses are following.

Comment #11

- k) What were the CO emission limits for Nitric Acid Plants #1 and #3 if any specified in the initial permit number 2008-100-C issued on February 19, 2009?

Response

These were not included in the first draft as the facility did not realize CO emissions would result from NOx control technology as detailed on Page 2 of the memo.

Comment #12

- l) Clarify which one of the two different limits given in “Specific Conditions” and the “requested enforceable limits” are really enforceable?

Response

Both annual limits are included under Specific Condition 1. C. The permit specifies stack testing to confirm the basis of emission calculations. Compliance is based on a 12-month rolling cumulative total as specified in C. i.. Specific Condition #12 requires the facility to keep records of total raw material throughput and product. The combination of these conditions should assure the limits are federally enforceable. Review of the Nitric Acid table resulted in identifying a typographical error. The lb/ton designation for the CO limits should have been labeled TPY as indicated in the permit memo.

Comment #13

- m) When Nitric Acid Plant #1 emits 4.0 lbs/hr CO it would reach the annual “Specific Conditions limit” of 16.8 tpy in 350 days or the “requested enforceable limit” of 14.6 tpy in 304 days. Is the plant shut down for the balance days per year depending on which limit is applicable?

Response

Same response as comment #9. However, PCC originally proposed 16.8 TPY for Plant #1 and 12.6 TPY for Plant #3. PCC subsequently proposed to change these to 14.6 TPY and 11.0, respectively. The memo will be updated to reflect this.

Comment #14

- n) When Nitric Acid Plant #3 emits 3.0 lbs/hr CO it would reach the annual “Specific Conditions limit” of 12.6 tpy in 350 days or the “requested enforceable limit” of 11.0 tpy in 305 days. Is the plant shut down for the balance days per year depending on which, limit is applicable?

Response

Same response as Comment #13.

Comment #15

- o) On Draft/Proposed Permit page 2/83, Index number 10 does not specify what Operating Unit it refers to.

Response

Index Number 10 falls under the heading “Specific Condition No 1 C.”. Review of the permit concerning this condition shows the units contained in this condition are Nitric Acid Plants #1, #3, and #4.

Comment #16

- p) The statement “Therefore, provided Nitric Acid Plant #4 was not rebuilt, reconstructed, or modified since its original installation date, then it is not subject to [40 CFR 60] Subpart G” on Draft/Proposed Permit page 49/83 is subjective. A definite statement whether the Nitric Acid Plant was changed or not is necessary to clarify the position.

Response

The following analysis was received from PCC concerning modification and reconstruction under NSPS:

The emission limits established in the revised PSD construction permit M-2 are based on the maximum short-term design capacity of the unit. LSB/PCC has stated in previous correspondence that a detailed engineering task force review conducted in mid-2010 confirmed the maximum short-term capacity of Nitric Acid Plant #4 at 400 tons/day (100% nitric acid basis). No maintenance related activities conducted as part of the re-start of Nitric Acid Plant #4 have altered the short-term design capacity of the plant in such a way that pollutant emissions rates, on a kg/hr or lb/hr basis, have increased. As further clarification, LSB/PCC states that the physical and operational integrity evaluations conducted on Nitric Acid Plant #4 during construction and start-up operations resulted only in equipment maintenance, repair, and replacement activities consistent with the modification exemption under 40 CFR §60.14(e)(1) above.

Per LSB's project engineering group, approximately \$3,300,000 has been capitalized to date related to the pre and post startup maintenance and repair of Nitric Acid Plant #4. The engineering group also provided a preliminary estimate of the fixed capital cost of a new, 400 ton/day nitric acid plant. That cost is \$75,000,000. Because the maintenance costs are less than 50% of the cost of a new plant, the 40 CFR Part 60 threshold indicated above for reconstruction has not been exceeded. NSPS Subpart G should not be applicable on the basis of reconstruction.

Based on this review and previous permitting indicating Plant #4 production capacity 400 ton/day, ODEQ determined Plant #4 did not become subject to Subpart G as a result of modification or reconstruction.

Comment #17

- q) On Draft/Proposed Permit pages 23/83 & 24/83 give the Emissions Summary for the different plant units and the total for the entire plant. 40 CFR 51.166(c) defines the manner in which the 'significant emissions increase of a regulated NSR pollutant' is to be calculated 'for projects that only involve existing emission units'. Such a calculation should be presented to verify whether there is a 'significant emissions increase'.

Response

As detailed in multiple responses this was considered a reopening or modification to the original PSD permit, therefore, no analysis is required. A conservative review was completed by subjecting applicable units to BACT and a complete new NAAQS analysis.

Comment #18

- r) On Draft/Proposed Permit page 24/83 gives PM₁₀ emissions in two tables, named 1] Emissions Summary and 2] Assessment of PM_{2.5} Emissions. The first table gives the total of PM₁₀ as 33.4 tpy. Clarification is necessary as to why the PM₁₀ emissions given on the second table add up to 38.50 tpy.

Response

This table inadvertently included Ammonia Plants #1 and #3. These will be removed from the table. The Emissions Summary Table failed to double the 0.6 TPY estimate as the result of two plants. This has been corrected to 1.2 TPY. Other differences resulted from minor inconsistencies in rounding of values. Both tables now show 34 TPY PM₁₀. The actual permit limits correctly identified emission estimate/limits.

Comment #19

- s) Producing Hydrogen by the catalytic steam reforming of methane is the "Steam Methane Reformer" [SMR] process that is used in other industries such as refineries. SMR produces Hydrogen and Carbon Monoxide out of Natural Gas which contains a high percentage of Methane. A few of the SMR used in other industries are listed below.
- i) Clarification is necessary as to why the technologies used in other SMR cannot be

used by PCC.

- ii) Clarification is necessary as to why PCC is requesting 0.15 NO_x lbs/MMBtu when other SMR run at much lower values.
- iii) Similar clarification is necessary with regard to the higher values requested for CO and PM.

RBLC ID	Process Code	MMBtu/hr	NO_x lbs/hr	CO lbs/hr	PM lbs/hr	NO_x lbs/MMBtu
OK-0135	61.012	225/770 ^{B*}	33.75*	18.5	1.26	0.15*
TX-0288	62.999	286.00	8.58	6.93	3.3	0.03
TX-0443	13.390	-	3.10	3.10	0.20	-
OH-0329	50.003	519.00	23.40	18.60	3.90	0.01
PA-0231	50.999	344.00	13.70	28.21	1.60	0.02
LA-0211	11.390	1412.50	0.0125 ^C	0.040 ^C	0.0075 ^C	0.01
LA-0245	11.310	1055.00	0.015 ^C	0.0800 ^C	0.0075 ^C	0.015
TX-0443	13.390	-	8.90	20.70	1.90	-
LA-0236 ^A	61.012	6810.0 ^B	-	303.47	-	-

^A Ammonia Plant Reformer ^B tpd ^C lbs/MMBtu *Requested

Response

With regard to the ammonia plant NO_x BACT, this permit action is intended to address NO_x BACT compliance issues with the original BACT determination completed in permit action 2008-100-C PSD in which no comments were received. As detailed in the response to Comment #5, ODEQ is not making a final BACT determination at this point but approving a trial BACT review process and timeline. The final BACT determination will require a permit modification and include public/EPA review. The 0.12 lb/mmbtu is a minimum requirement that was used to demonstrate NAAQS compliance during this trial period. The final BACT may well result in a lower limit.

ODEQ agrees that similar SMR used in other processes should be considered during this review and should only be excluded based on technological limitations or differences. This is already included in #7 of the compliance schedule in the specific conditions.

With regard to CO and PM emissions from the Ammonia Plant #4, neither pollutant is a consideration of this permit action. These determinations were completed in the previous permit action. However, the listed PM limit of (1.26/225) 0.006 lb/mmbtu is, as stringent, or more stringent than the listed sources. Approved CO BACT levels vary significantly. The approved CO BACT of 0.082 does fall within the higher range of the EPA listed sources (PA-0231 – 0.082 lb/mmbtu).

Comment #20

- t) There is no evidence to verify whether Startup, Shutdown and Malfunction emissions have been included in the total emissions. Please provide detailed explanation.

Response

The proposed emission limits for the existing sources included in revised PSD construction permit M-1 are based on the maximum short-term operational capacity of the equipment operating at or near 8,760 hours per year. In developing the proposed limits, PCC considered emissions during startup, shutdown, and scheduled maintenance (SSM) events. The permit and memo will be updated to reflect this.

SECTION X. SUMMARY

There are no active Air Quality compliance or enforcement issues that would affect the issuance of this permit. Issuance of the construction permit is recommended.

**PERMIT TO CONSTRUCT
AIR POLLUTION CONTROL FACILITY
SPECIFIC CONDITIONS**

**Pryor Chemical Company
Pryor - Mid America Industrial Park Facility**

Permit No. 2008-100-C (M-1) (PSD)

The permittee is authorized to construct in conformity with the specifications in the application for a construction permit submitted to Air Quality on June 1, 2011, with additional information received on August 1, 2011. The Evaluation Memorandum dated July 16, 2012, explains the derivation of applicable permit requirements and the estimates of emissions; however, it does not contain operating limitations or permit requirements. Commencing construction or operations under this permit constitutes acceptance of, and consent to, the conditions contained herein.

1. Points of emission and emissions limitations. Permittee shall maintain and operate the facility in a manner to prevent the exceedance of ambient air quality standards contained in OAC 252:100-3 and the limitations established by this permit. Compliance with emissions limits shall be monitored and determined based on the following averaging periods:

[OAC 252:100-8-6(a)(1)], [OAC 252:100-7-15(d)]

- i. CO: 1-hour and 8-hour averages; all emissions units.
- ii. PM₁₀: 24-hour average; all emissions units.
- iii. NO₂: 1-hour average all emissions units.
- iv. All annual pollutant and throughput limits: Monthly and 12-month rolling cumulative, unless specified more frequently.

EUG NO. 1 - AMMONIA PLANT #4

- A. Maximum production of ammonia from Ammonia Plant #4 shall not exceed 770 tons per day. The permittee shall follow good combustion practices as required by Specific Condition No. 7.C so as to limit hourly and annual emissions to the values specified in the following table. Compliance with the SO₂ limit is determined by the fuel sulfur monitoring requirements of Condition No. 2.

EU ID 101 - Primary Reformer

Pollutant	Maximum (lb/hr)	Annual (ton/yr)
CO	18.6	81.2
NO _x	27.0	118.3
PM	1.7	7.4
PM ₁₀	1.3	5.6
VOC	1.3	5.4
SO ₂	12.6	2.9
Formaldehyde	0.02	0.07

- i. SO₂ limits on the Primary reformer include waste fuels. See Specific Condition No. 2 for restrictions on natural gas.
 - ii. NO_x limits are based on a trial BACT limit of 0.12 lbs/MMBtu to be effective during a 1-year BACT analysis, as set forth in the “Compliance Schedule” below.
- B. Maximum condensate throughput and emissions from the Condensate Steam Flash Drum shall not exceed the limits specified in the following table. The permittee shall control process conditions as required by Specific Condition No. 7.A so as to limit hourly and annual emissions to the values specified in the following table.

EU ID 102 - Condensate Steam Flash Drum

Pollutant	Stack Gas Discharge Rate	Emissions	
	lb/hr	Maximum (lb/hr)	Annual (ton/yr)
VOC	1,050	10.4	45.6
NH ₃		5.4	23.7
CH ₃ OH		3.86	9.5

EUG NO. 3 – NITRIC ACID PLANTS #1, #3, and #4

- C. Maximum emissions from Nitric Acid Plant #1, Nitric Acid Plant #3, and Nitric Acid Plant #4 and emissions of ammonia from Nitric Acid Plant #4 shall not exceed the limits specified in the following tables. Compliance with the NO_x emission limits for Nitric Acid Plant #1, Nitric Acid Plant #3, and Nitric Acid Plant #4 shall be demonstrated per the monitoring requirements in Specific Condition 8. The permittee shall record the hourly emissions, the monthly emissions, the 12-month rolling cumulative emissions, the hourly production of 100% nitric acid, the monthly production of 100% nitric acid, the 12-month rolling cumulative production of 100% nitric acid, and the daily operating hours.
- i. Annual Limit. Compliance with the annual CO and ammonia slip emissions limits (in tons per year) shall be determined by comparing the 12-month rolling cumulative emissions (in tons per year) to the annual limits (in tons per year) listed in the table below. CO emissions will be calculated based on the emission factor verified during initial performance testing and nitric acid production data. Ammonia emissions will be calculated based on initial performance test data and hours of operation. Compliance with the annual average NO_x emission factor (in pounds per ton) shall be determined by dividing the 12-month rolling cumulative emissions (in pounds) by the 12-month rolling cumulative production of 100% nitric acid (in tons) to obtain a value in pounds per ton, and comparing the result to the limits listed in the table below. Compliance shall be verified monthly, datum the same time on the first day of each month (or the following business day if the facility is not in operation on the designated day).

$$\text{Emissions}_{12\text{-Month Average}} = \frac{\text{12-Month Rolling Cumulative Emissions}}{\text{12-Month Rolling Cumulative 100\% Nitric Acid}}$$

- ii. 7-day (168-hour) Average Limit. Compliance with the 7-day average NO_x limit (in pounds per ton) shall be determined by dividing the 7-day (168-hour) rolling cumulative emissions by the corresponding production of 100% nitric acid for the applicable 7-day (168-hour) period and comparing the result to the limit of 3.0 pounds per ton.

$$\text{Emissions}_{7\text{-Day Average}} = \frac{\text{7-Day (168-hour) Rolling Cumulative Emissions}}{\text{7-Day (168-hour) Rolling Cumulative 100\% Nitric Acid}}$$

EU ID 301, 302, 303 – Nitric Acid Plants #1, #3, and #4

Emissions Point	NO _x Emissions			CO Emissions	
	12-month rolling cumulative		7-day Average		
	Annual (ton/yr)	Annual (lb/ton)	Maximum (lb/ton)	Maximum (lb/hr)	Maximum (ton/yr)
Plant #1	58.4	1.6	3.0	4.0	14.6
Plant #3	43.8	1.6	3.0	3.0	11.0
Plant #4	159.7	2.5	3.0	N/A	N/A

- iii. Hourly Limit for Ammonia Slip Emissions. Compliance shall be based on the manufacturer's guarantee of 10 ppmv in the exhaust gas of the SCR unit. Initial compliance with the limit shall be verified by the initial performance test required in Specific Condition No. 9. Continuous compliance shall be documented by means of continuous NO_x monitoring, tracking nitric acid production, and operation of the SCR unit in accordance with the manufacturer's recommendations. Records of these monitoring parameters and operating practices shall be maintained at the facility.

EU ID 303 - Nitric Acid Plant #4

Emissions Point	NH ₃ Slip Emissions	
	Maximum (lb/hr)	Annual ton/yr
Plant #4	0.9	3.8

EUG NO. 4 – NITRIC ACID PREHEATERS #1, #3, and #4

- D. Emissions from each individual nitric acid preheater shall not exceed the limits specified in the following table. The permittee shall follow good combustion practices as required by Specific Condition No. 7.C to limit hourly and annual emissions to the values specified in the following table. Compliance with the SO₂ limit is determined by the fuel sulfur monitoring requirements of Condition No. 2.

EU ID 401, 402, 403 - Nitric Acid Preheaters #1, #3, and #4

Pollutant	Emissions	
	Maximum (lb/hr)	Annual (ton/yr)
CO	1.7	7.3
NO _x	1.0	4.3
PM	0.2	0.7
PM ₁₀	0.2	0.5
VOC	0.2	0.5
SO ₂	0.1	0.2

EUG NO. 5 – CARBON DIOXIDE VENT

- E. PCC produces carbon dioxide as a saleable product. Carbon monoxide is a component of the carbon dioxide generated as an off-gas from the ammonia manufacturing process. Carbon dioxide venting is limited as indicated in the following table for the purpose of limiting the associated carbon monoxide emissions. Carbon monoxide emissions from the Carbon Dioxide Vents (EU IDs 501a, 501b, and 501c) shall not exceed the limits specified in the following table. Compliance with the carbon dioxide venting and carbon monoxide emission limits shall be demonstrated by multiplying the actual daily ammonia production total by 1.25, which is the stoichiometric ratio of CO₂ generated from the ammonia production process with a contingency; multiplying that product by an industry established carbon monoxide ratio of 0.1 lb-CO per ton CO₂; and then dividing the result by the process equipment (i.e., ammonia process equipment) operating hours for that day. These values shall be verified during initial performance testing over a range of operational parameters expected to occur during normal operations.

EU ID 501a, 501b, and 501c – Carbon Dioxide Vent

Pollutant	Emissions Factor	Carbon Dioxide Vented	CO Emissions	
	lb/ton	ton/hr	Maximum (lb/hr)	Annual (ton/yr)
CO	0.1	36.5	4.0	17.6

EUG NO. 6 - AMMONIUM NITRATE PLANTS #1 and #2

- F. Maximum liquid ammonium nitrate production shall not exceed the following individual rates.
- Ammonium Nitrate Plant #1 - 23.8 tons per hour
 - Ammonium Nitrate Plant #2 - 23.8 tons per hour
- PCC does not measure the hourly production rate for liquid ammonium nitrate. Therefore, compliance with the liquid ammonium nitrate production limits shall be demonstrated for each plant by dividing the actual daily liquid ammonium nitrate production total by the process equipment operating hours for that day.

G. Emissions shall not exceed the following limits from either neutralizer.

EU ID 601, 602 - Ammonium Nitrate Plant #1 and #2 Neutralizer Vents

Pollutant	Emissions	
	Maximum (lb/hr)	Annual (ton/yr)
NH ₃	2.4	0.6
PM/PM ₁₀	1.2	0.6

EUG NO. 7 - GRANULATOR SCRUBBERS #1, #2, and #3

H. Maximum dry ammonium nitrate production shall not exceed 16.7 tons per hour from the granulator production system or prill tower controlled by either Granulator Scrubber #1, #2, or #3, 24-hour average. Compliance with the granulator or prill tower production limits and the emission limits indicated in the table below shall be demonstrated by dividing the actual daily dry ammonium nitrate production total by the process equipment operating hours for that day.

I. Emissions from any individual granulator scrubber shall not exceed the following limits.

EU ID 701, 702, 703 - Granulator Scrubbers #1, #2, and #3

Pollutant	Emissions	
	Maximum (lb/hr)	Annual (ton/yr)
PM	0.7	2.9
PM ₁₀	0.7	2.9
NH ₃	2.3	10.2

EUG NO. 8 – BOILERS #1 and #2

J. Emissions from each boiler shall not exceed the following limits.

EU ID 801 - Boiler #1

Pollutant	Emissions	
	Maximum (lb/hr)	Annual (ton/yr)
CO	4.4	19.2
NO _x	2.6	11.4
PM	0.4	1.8
PM ₁₀	0.3	1.3
SO ₂	0.1	0.4
VOC	0.3	1.3
Formaldehyde	0.01	0.02

EU ID 802 – Boiler #2

Pollutant	Emissions	
	Maximum (lb/hr)	Annual (ton/yr)
CO	6.6	28.9
NO _x	4.0	17.2
PM	0.6	2.7
PM ₁₀	0.5	2.0
SO ₂	0.2	0.6
VOC	0.5	1.9
Formaldehyde	0.01	0.03

- K. NSPS Dc, §60.48c, Reporting and recordkeeping requirements. [40 CFR 60.72]
- i. Boiler #2. As an alternative to meeting the daily record keeping requirements of §60.48c(g)(1), the permittee may record and maintain records of the amount of each fuel combusted in each boiler each calendar month.

EUG NO. 9 - COOLING TOWERS #1 and #2

- L. Maximum circulation rate of Cooling Tower # 1 shall not exceed 1,470,000 gallons per hour.
- M. Maximum circulation rate of Cooling Tower No. 2 shall not exceed 2,400,000 gallons per hour.
- N. No chromium-containing additives shall be used in the cooling towers.
- O. Emissions shall not exceed the following limits.

EU ID 901 – Cooling Tower No. 1

Pollutant	Emissions	
	Maximum (lb/hr)	Annual (ton/yr)
PM ₁₀	1.2	5.2

EU ID 902 – Cooling Tower No. 2

Pollutant	Emissions	
	Maximum (lb/hr)	Annual (ton/yr)
PM ₁₀	2.0	8.5

- P. Compliance with the circulation and emission limits for each cooling tower shall be demonstrated by multiplying total pump capacity by the number of pumps operating during each hour. Pump capacity shall be demonstrated either by the manufacturer's visible capacity rating stamped on the equipment or by maintaining a copy of the manufacturer's performance data at the facility. In either event, the pump model or serial number must be identified on the pump.

EUG NO. 10 – GASOLINE STORAGE TANK

Q. Emissions of VOC from the gasoline storage tank are limited to 0.2 tons per year. Compliance with this limit shall be demonstrated by limiting the annual throughput of gasoline to 12,000 gallons, 12-month rolling cumulative. Permittee shall maintain records of gasoline throughput

2. The fuel-burning equipment shall be fired with pipeline natural gas having 0.25 grains/100 scf or less total sulfur. EU ID 101 Ammonia Plant #4 Primary Reformer may be fired on either natural gas or a combination of natural gas, waste gas generated from the Natural Gas Desulfurization Unit, and process off-gas (e.g., purge gas). Compliance with the sulfur limit on pipeline gas can be shown by the following methods: a current gas company bill, lab analysis, stain-tube analysis, gas contract, tariff sheet, or other approved methods. Compliance shall be demonstrated at least once annually. [OAC 252:100-8-6(a)(1)]
3. The permittee shall conduct only the processes associated with the manufacture of ammonia, ammonium nitrate, urea, nitric acid, and by-products including carbon dioxide. [OAC 252:100-8-6(a)(1)]
4. Each Emissions Unit (EU) shall be clearly labeled with the EU number on the unit in a conspicuous location that can be easily accessed for inspection. For units not having emissions controls, the EU label shall be located as near the emissions stack as practical, considering safety and ease of inspection. [OAC 252:100-43]
5. The facility is subject to 40 CFR 63, Subpart CCCCCC, National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities, including but not limited to the following. [40 CFR 63]

§63.11111 Am I subject to the requirements in this subpart?

§63.11112 What parts of my affected source does this subpart cover?

§63.11113 When do I have to comply with this subpart?

§63.11115 What are my general duties to minimize emissions?

§63.11116 Requirements for facilities with monthly throughput of less than 10,000 gallons of gasoline. Note that §63.11116(b) exempts the source from the requirement to submit notifications or reports as specified in §63.11125, §63.11126, or subpart A of this part, but you must have records available within 24 hours of a request by the Administrator to document your gasoline throughput.

§63.11130 What parts of the General Provisions apply to me?

§63.11132 What definitions apply to this subpart?

Table 3 to Subpart CCCCCC of Part 63—Applicability of General Provisions

6. The permittee shall be authorized to operate the sources 24 hours per day, every day of the year. [OAC 252:100-8-6(a)(1)]

7. Monitoring. [OAC 252:100-8-6(a)(1)], [OAC 252:100-43]
- A. Ammonia Plant #4 - Condensate Steam Flash Drum, Point ID #102. Permittee shall assume the maximum design discharge stack gas flow from the Condensate Steam Flash Drum exhaust of 1,050 pounds per hour in calculating the methanol emissions to ensure that emissions are at or below the limit of 9.5 tons per year. Permittee shall conduct testing of the Condensate Steam Flash Drum exhaust monthly using sampling protocols approved by the ODEQ and GC/FID standard analytical methods.
- i. Permittee shall maintain a plan for monitoring process conditions using parameters such as temperature, pressure, condensate throughput, and periodic measurement of methanol in the condensate to demonstrate continuous compliance with the methanol emission limits. The plan shall establish action levels corresponding to operating conditions which cannot be exceeded to ensure compliance with the permit limits, as well as the technical justification for selection of the selected monitoring parameters.
- B. By letter dated September 3, 2010, ODEQ authorized PCC to report excess emissions associated with startup and shutdown of Nitric Acid Plant #4 on a quarterly basis. This alternative reporting allowance was extended plantwide in an email to PCC dated September 20, 2010.
- C. Good Combustion Practices shall be followed for the Ammonia Plant #4 Primary Reformer, Boilers #1 and #2, Nitric Acid Preheaters #1, #3, and #4 - Point ID #101, #801, #802, #401, #402, #403.
- i. The permittee shall maintain and operate combustion equipment to achieve optimum combustion efficiency and perform periodic maintenance necessary to maintain proper operation.
- ii. The permittee shall perform weekly inspections of the combustion controls for proper operation. Burners shall be inspected during shutdown. Permittee shall immediately perform any maintenance necessary to maintain equipment at the performance standards specified by the manufacturer(s).
- iii. The permittee shall perform daily opacity measurements using EPA Method 9 and conduct initial performance testing to correlate the PM limit to an opacity action level.
- D. Good Operation Practices – All Emission Point IDs.
The permittee shall exercise all reasonable and necessary operational and preventive measures and actions to control emissions within the BACT limits specified in Specific Condition No. 1 including, but not limited to, minimizing startup and shutdown times and reducing throughput.
8. Compliance Assurance Monitoring (CAM). [OAC 252:100-8-6(a)(1)], [OAC 252:100-43]
- A. Nitric Acid Plant #1, Nitric Acid Plant #3, Nitric Acid Plant #4, EU IDs 301, 302, and 303. The permittee shall implement compliance assurance monitoring (CAM) in accordance with 40 CFR Part 64 and shall install, calibrate, maintain, and operate continuous monitoring systems (CEMS) in accordance with Part 64 and any applicable referenced regulations therein.
- i. The permittee shall install, calibrate, maintain, and operate a continuous emissions monitoring system for measuring nitrogen oxides (NO_x) in accordance with the provisions of 40 C.F.R. §60.13 and conduct initial performance testing.

- ii. Granulator Scrubbers #1, #2, and #3, EU IDs 701, 702, and 703. The permittee shall limit the hourly production rate of dry ammonium nitrate at the granulator or prill tower to 16.7 tons per hour. Compliance with the production limit shall be demonstrated by dividing the actual daily dry ammonium nitrate production total by the process equipment operating hours for that day. The permittee shall perform daily opacity measurements using EPA Method 9 and conduct initial performance testing to correlate the PM limit to an opacity action level. Within sixty days (60) of startup, permittee shall submit, for approval by the Air Quality Division, a proposed monitoring plan that includes, in addition to the daily opacity monitoring requirement of this condition, at least one secondary monitoring parameter to be used as a surrogate or parametric monitoring to document continuous compliance with the permit limits.
 - B. The CEMS shall be fully functional and properly operating at startup of the nitric acid plants. Permittee shall follow the requirements 40 C.F.R. §60.13 including installation and calibration. [40 CFR 64.4(e)]
 - C. The permittee shall comply with all applicable requirements of CAM including but not limited to the following. [40 CFR 64.1 to 64.9]
 - i. §64.7 Operation of approved monitoring;
 - ii. §64.8 Quality improvement plan (QIP) requirements; and
 - iii. §64.9 Reporting and recordkeeping requirements.
9. Maintenance and Monitoring of Controls. [OAC 252:100-43]
- A. The air pollution control devices may be modified or replaced, upon prior approval of the AQD, provided that it can be demonstrated that the replacement equipment is at least as efficient as the previous pollution control device.
 - B. Permittee shall maintain at the facility, an operation and maintenance plan that includes, at a minimum, the following elements.
 - i. A visual inspection of each pollution control device shall be performed at a frequency recommended by the manufacturer(s), but no less than weekly. The pollution control devices shall be maintained and operated as recommended by the manufacturers to maintain the required efficiency, including the recommended operating parameters such as, but not limited to, operating pressures/temperatures. Expendable components shall be replaced on a frequency recommended by the manufacturer, or sooner if necessary. The capture system and the housing for the controls shall be constructed and maintained to prevent bypass of emissions.
 - ii. A complete preventive maintenance inspection of the pollution control device shall be performed semi-annually, or at intervals recommended by the manufacturer, whichever occurs more frequently.
 - iii. In the event of any malfunction of pollution control equipment which results in an exceedance of any permit limit, the permittee shall immediately shut down the affected emissions unit(s) and perform any repairs necessary to restore the performance of the pollution control equipment to the permitted standard(s), prior to returning the emissions units back to production.
10. Within 60 days of start-up, and at other such times as directed by the AQD, the permittee shall conduct performance testing as follows and furnish a written report to the AQD. Testing

shall be conducted while a process unit is being operated at least 90% of maximum hourly capacity. A sampling protocol and notification of testing date(s) shall be submitted at least 30 days in advance of commencement of testing. The following USEPA methods shall be used for testing of emissions, unless otherwise approved by Air Quality: [OAC 252:100-43]

Point ID	Description	Pollutants Tested	Test Methods Required
102	Condensate Steam Stripper	VOC, Methanol	1 – 4, 624, GC/FID GC120P030.M
301	Nitric Acid Plant # 1 - Fumeabator Unit	NO _x , CO	1 – 4, 7E, 10
302	Nitric Acid Plant # 3 - Fumeabator Unit	NO _x , CO	1 – 4, 7E, 10
303	Nitric Acid Plant # 4 - SCR Unit	NO _x , CO, NH ₃	1 – 4, 7E, 10, 350.2 or 350.3
501	Carbon Dioxide Vent	CO	1 – 4, 10
701	Granulator Scrubber #1	PM	1 – 5
702	Granulator Scrubber #2	PM	1 – 5
703	Granulator Scrubber #3	PM	1 – 5

11. The permittee shall keep records of operations as listed below to verify Insignificant Activities. These records shall be kept on-site for a period of at least five years following dates of recording and shall be made available to regulatory personnel upon request. No recordkeeping is required for those operations which qualify as Trivial Activities.

[OAC 252:100-8-2], [OAC 252:100-8-6 (a)(3)(B)]

- a. Emissions from storage tanks constructed with a capacity less than 39,894 gallons, which store VOC with a vapor pressure less than 1.5 psia at maximum storage temperature. Records verifying the contents of the tanks.

Name and Contents	Capacity (gallons)
Urea Plant Feed (Ammonia Head Tank)	15,857
#2 Urea Plant Ammonia Recovery Tank	9,406
CO ₂ Plant Ammonia Recovery Tank	1,128
Ammonium Nitrate Plant #1 Rundown Tank	950
Ammonium Nitrate Plant #2 Rundown Tank	950
AU & BU Urea Blend Tanks	10,000
OBT Mix Tank	36,500

- b. Activities having the potential to emit no more than 5 TPY (actual) of any criteria pollutant. Records sufficient to verify actual emissions.

Name and Contents	Capacity (gallons)
Atmospheric Anhydrous Ammonia Storage Tank	5,640,000
Wastewater Storage Tank	1,000,000
2100 Nitric Acid Storage Tank	389,243
200 Nitric Acid Storage Tank	62,563
Ammonium Nitrate Storage Tank	267,314

U.A.N. Blend Tank	57,337
2 – U.A.N. Storage Tanks (AS & DS)	3,760,346 each
2 – U.A.N. Storage Tanks (BS & CS)	116,471 each
RO Treated Water Storage Tank	50,000
5 – Pressurized Anhydrous Ammonia Storage Tanks	78,800 each

Granular Ammonium Nitrate Storage, Handling, and Loading/Unloading operations
 Ammonia Truck and Railcar Loading
 Ammonia Plant #4 Fugitives
 Nitric Acid Loading to Trucks and Railcars
 Off-Specification UAN and AN loading to Trucks and Railcars
 Ammonia Plant #4 Desulfurization Unit – Carbon Regeneration Using Steam
 Ammonia Storage Flare

12. The permittee shall keep records of facility operations as listed below. These records shall be retained on-site for a period of at least five years following the dates of recording and shall be made available to regulatory personnel upon request. [OAC 252:100-8-6 (a)(3)(B)]

- a. Total throughput of raw materials and products having limits specified in Condition No. 1; hourly, daily, 7-day, rolling cumulative monthly, and 12-month rolling cumulative total, as specified in the condition for each limit.
- b. Records of monitoring and inspection of all air pollution control equipment required by the conditions of this permit.
- c. Calculations showing compliance with all specific conditions that require calculations.
- d. For the fuel(s) burned, the appropriate document(s) as described in Specific Condition No. 2.
- e. Records required by NSPS Dc.
- f. Records required for CEMS operations.
- g. Records required for CAM.
- h. Records required by NESHAP CCCCCC and Specific Condition No. 1.Q.

13. The Permit Shield (Standard Conditions, Section VI) is extended to the following requirements that have been determined to be inapplicable to this facility.

[OAC 252:100-8-6(d)(2)]

- a. OAC 252:100-7 Permits for Minor Facilities
- b. OAC 252:100-11 Alternative Emissions Reduction
- c. OAC 252:100-15 Mobile Sources
- d. OAC 252:100-17 Incinerators
- e. OAC 252:100-23 Cotton Gins
- f. OAC 252:100-24 Particulate Emissions From Grain, Feed, or Seed Operations
- g. OAC 252:100-35 Carbon Monoxide
- h. OAC 252:100-39 Nonattainment Areas
- i. OAC 252:100-47 Landfills
- j. 40 CFR Part 72 Acid Rain

COMPLIANCE SCHEDULE

During the 1-year BACT analysis provided by Specific Condition No. 1.A.ii, Permittee shall:

- 1) Assess the design operating conditions and fuel characteristics that form the basis for the burner manufacturer's emissions guarantee, including the properties of the fuel gases.
- 2) Review the combustion and process controls affecting the Primary Reformer to identify potential methods to reduce/minimize NO_x emissions, including burner tuning and automation improvements.
- 3) Review facility operating procedures to identify potential techniques to reduce/minimize NO_x emissions.
- 4) Review any methods currently in place to minimize the components of waste fuels burned in the Primary Reformer that generate NO_x emissions and identification of any potential methods, procedures, work practices, techniques, controls, etc., that are available for the reduction/minimization of such fuel components.
- 5) Based on the findings in Item Nos. 1 through 4, implement economically feasible control options to attain best achievable NO_x emissions reductions.
- 6) Conduct all testing necessary to support the BACT analysis and to quantify emissions during any set of operational conditions including variations in fuel, and adequate to categorize increases in NO_x emissions above the current BACT limit as thermal NO_x, fuel NO_x or prompt NO_x.
- 7) Analyze add-on controls used in other industries to reduce NO_x emissions, for example but not limited to, Selective Catalytic Reduction, Non-Selective Catalytic Reduction as well as methods of lowering exhaust temperatures to reduce thermal NO_x emissions.
- 8) Submit bi-monthly progress reports during the BACT analysis.
- 9) Within 60 days of the termination of the one-year BACT analysis, submit an application for a permit which will include the final BACT analysis and BACT limit, and an analysis indicating if any other pollutant is affected by this final determination.
- 10) Include with the application, an assessment of CAM and if needed, a CAM Plan.
- 11) Review the impacts of secondary formation of PM_{2.5} resulting from the increase in NO_x emissions.

Failure to meet the deadline specified in this compliance schedule may result in withdrawal of the permit and/or potential enforcement actions by the Air Quality Division.

**MAJOR SOURCE AIR QUALITY PERMIT
STANDARD CONDITIONS
(July 21, 2009)**

SECTION I. DUTY TO COMPLY

A. This is a permit to operate / construct this specific facility in accordance with the federal Clean Air Act (42 U.S.C. 7401, et al.) and under the authority of the Oklahoma Clean Air Act and the rules promulgated there under. [Oklahoma Clean Air Act, 27A O.S. § 2-5-112]

B. The issuing Authority for the permit is the Air Quality Division (AQD) of the Oklahoma Department of Environmental Quality (DEQ). The permit does not relieve the holder of the obligation to comply with other applicable federal, state, or local statutes, regulations, rules, or ordinances. [Oklahoma Clean Air Act, 27A O.S. § 2-5-112]

C. The permittee shall comply with all conditions of this permit. Any permit noncompliance shall constitute a violation of the Oklahoma Clean Air Act and shall be grounds for enforcement action, permit termination, revocation and reissuance, or modification, or for denial of a permit renewal application. All terms and conditions are enforceable by the DEQ, by the Environmental Protection Agency (EPA), and by citizens under section 304 of the Federal Clean Air Act (excluding state-only requirements). This permit is valid for operations only at the specific location listed.

[40 C.F.R. §70.6(b), OAC 252:100-8-1.3 and OAC 252:100-8-6(a)(7)(A) and (b)(1)]

D. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in assessing penalties for noncompliance if the health, safety, or environmental impacts of halting or reducing operations would be more serious than the impacts of continuing operations. [OAC 252:100-8-6(a)(7)(B)]

SECTION II. REPORTING OF DEVIATIONS FROM PERMIT TERMS

A. Any exceedance resulting from an emergency and/or posing an imminent and substantial danger to public health, safety, or the environment shall be reported in accordance with Section XIV (Emergencies). [OAC 252:100-8-6(a)(3)(C)(iii)(I) & (II)]

B. Deviations that result in emissions exceeding those allowed in this permit shall be reported consistent with the requirements of OAC 252:100-9, Excess Emission Reporting Requirements. [OAC 252:100-8-6(a)(3)(C)(iv)]

C. Every written report submitted under this section shall be certified as required by Section III (Monitoring, Testing, Recordkeeping & Reporting), Paragraph F. [OAC 252:100-8-6(a)(3)(C)(iv)]

SECTION III. MONITORING, TESTING, RECORDKEEPING & REPORTING

A. The permittee shall keep records as specified in this permit. These records, including monitoring data and necessary support information, shall be retained on-site or at a nearby field office for a period of at least five years from the date of the monitoring sample, measurement, report, or application, and shall be made available for inspection by regulatory personnel upon request. Support information includes all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. Where appropriate, the permit may specify that records may be maintained in computerized form.

[OAC 252:100-8-6 (a)(3)(B)(ii), OAC 252:100-8-6(c)(1), and OAC 252:100-8-6(c)(2)(B)]

B. Records of required monitoring shall include:

- (1) the date, place and time of sampling or measurement;
- (2) the date or dates analyses were performed;
- (3) the company or entity which performed the analyses;
- (4) the analytical techniques or methods used;
- (5) the results of such analyses; and
- (6) the operating conditions existing at the time of sampling or measurement.

[OAC 252:100-8-6(a)(3)(B)(i)]

C. No later than 30 days after each six (6) month period, after the date of the issuance of the original Part 70 operating permit or alternative date as specifically identified in a subsequent Part 70 operating permit, the permittee shall submit to AQD a report of the results of any required monitoring. All instances of deviations from permit requirements since the previous report shall be clearly identified in the report. Submission of these periodic reports will satisfy any reporting requirement of Paragraph E below that is duplicative of the periodic reports, if so noted on the submitted report.

[OAC 252:100-8-6(a)(3)(C)(i) and (ii)]

D. If any testing shows emissions in excess of limitations specified in this permit, the owner or operator shall comply with the provisions of Section II (Reporting Of Deviations From Permit Terms) of these standard conditions.

[OAC 252:100-8-6(a)(3)(C)(iii)]

E. In addition to any monitoring, recordkeeping or reporting requirement specified in this permit, monitoring and reporting may be required under the provisions of OAC 252:100-43, Testing, Monitoring, and Recordkeeping, or as required by any provision of the Federal Clean Air Act or Oklahoma Clean Air Act.

[OAC 252:100-43]

F. Any Annual Certification of Compliance, Semi Annual Monitoring and Deviation Report, Excess Emission Report, and Annual Emission Inventory submitted in accordance with this permit shall be certified by a responsible official. This certification shall be signed by a responsible official, and shall contain the following language: "I certify, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete."

[OAC 252:100-8-5(f), OAC 252:100-8-6(a)(3)(C)(iv), OAC 252:100-8-6(c)(1), OAC 252:100-9-7(e), and OAC 252:100-5-2.1(f)]

G. Any owner or operator subject to the provisions of New Source Performance Standards (“NSPS”) under 40 CFR Part 60 or National Emission Standards for Hazardous Air Pollutants (“NESHAPs”) under 40 CFR Parts 61 and 63 shall maintain a file of all measurements and other information required by the applicable general provisions and subpart(s). These records shall be maintained in a permanent file suitable for inspection, shall be retained for a period of at least five years as required by Paragraph A of this Section, and shall include records of the occurrence and duration of any start-up, shutdown, or malfunction in the operation of an affected facility, any malfunction of the air pollution control equipment; and any periods during which a continuous monitoring system or monitoring device is inoperative.

[40 C.F.R. §§60.7 and 63.10, 40 CFR Parts 61, Subpart A, and OAC 252:100, Appendix Q]

H. The permittee of a facility that is operating subject to a schedule of compliance shall submit to the DEQ a progress report at least semi-annually. The progress reports shall contain dates for achieving the activities, milestones or compliance required in the schedule of compliance and the dates when such activities, milestones or compliance was achieved. The progress reports shall also contain an explanation of why any dates in the schedule of compliance were not or will not be met, and any preventive or corrective measures adopted. [OAC 252:100-8-6(c)(4)]

I. All testing must be conducted under the direction of qualified personnel by methods approved by the Division Director. All tests shall be made and the results calculated in accordance with standard test procedures. The use of alternative test procedures must be approved by EPA. When a portable analyzer is used to measure emissions it shall be setup, calibrated, and operated in accordance with the manufacturer’s instructions and in accordance with a protocol meeting the requirements of the “AQD Portable Analyzer Guidance” document or an equivalent method approved by Air Quality.

[OAC 252:100-8-6(a)(3)(A)(iv), and OAC 252:100-43]

J. The reporting of total particulate matter emissions as required in Part 7 of OAC 252:100-8 (Permits for Part 70 Sources), OAC 252:100-19 (Control of Emission of Particulate Matter), and OAC 252:100-5 (Emission Inventory), shall be conducted in accordance with applicable testing or calculation procedures, modified to include back-half condensables, for the concentration of particulate matter less than 10 microns in diameter (PM₁₀). NSPS may allow reporting of only particulate matter emissions caught in the filter (obtained using Reference Method 5).

K. The permittee shall submit to the AQD a copy of all reports submitted to the EPA as required by 40 C.F.R. Part 60, 61, and 63, for all equipment constructed or operated under this permit subject to such standards. [OAC 252:100-8-6(c)(1) and OAC 252:100, Appendix Q]

SECTION IV. COMPLIANCE CERTIFICATIONS

A. No later than 30 days after each anniversary date of the issuance of the original Part 70 operating permit or alternative date as specifically identified in a subsequent Part 70 operating permit, the permittee shall submit to the AQD, with a copy to the US EPA, Region 6, a certification of compliance with the terms and conditions of this permit and of any other applicable requirements which have become effective since the issuance of this permit.

[OAC 252:100-8-6(c)(5)(A), and (D)]

B. The compliance certification shall describe the operating permit term or condition that is the basis of the certification; the current compliance status; whether compliance was continuous or intermittent; the methods used for determining compliance, currently and over the reporting period. The compliance certification shall also include such other facts as the permitting authority may require to determine the compliance status of the source.

[OAC 252:100-8-6(c)(5)(C)(i)-(v)]

C. The compliance certification shall contain a certification by a responsible official as to the results of the required monitoring. This certification shall be signed by a responsible official, and shall contain the following language: "I certify, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete."

[OAC 252:100-8-5(f) and OAC 252:100-8-6(c)(1)]

D. Any facility reporting noncompliance shall submit a schedule of compliance for emissions units or stationary sources that are not in compliance with all applicable requirements. This schedule shall include a schedule of remedial measures, including an enforceable sequence of actions with milestones, leading to compliance with any applicable requirements for which the emissions unit or stationary source is in noncompliance. This compliance schedule shall resemble and be at least as stringent as that contained in any judicial consent decree or administrative order to which the emissions unit or stationary source is subject. Any such schedule of compliance shall be supplemental to, and shall not sanction noncompliance with, the applicable requirements on which it is based, except that a compliance plan shall not be required for any noncompliance condition which is corrected within 24 hours of discovery.

[OAC 252:100-8-5(e)(8)(B) and OAC 252:100-8-6(c)(3)]

SECTION V. REQUIREMENTS THAT BECOME APPLICABLE DURING THE PERMIT TERM

The permittee shall comply with any additional requirements that become effective during the permit term and that are applicable to the facility. Compliance with all new requirements shall be certified in the next annual certification.

[OAC 252:100-8-6(c)(6)]

SECTION VI. PERMIT SHIELD

A. Compliance with the terms and conditions of this permit (including terms and conditions established for alternate operating scenarios, emissions trading, and emissions averaging, but excluding terms and conditions for which the permit shield is expressly prohibited under OAC 252:100-8) shall be deemed compliance with the applicable requirements identified and included in this permit.

[OAC 252:100-8-6(d)(1)]

B. Those requirements that are applicable are listed in the Standard Conditions and the Specific Conditions of this permit. Those requirements that the applicant requested be determined as not applicable are summarized in the Specific Conditions of this permit.

[OAC 252:100-8-6(d)(2)]

SECTION VII. ANNUAL EMISSIONS INVENTORY & FEE PAYMENT

The permittee shall file with the AQD an annual emission inventory and shall pay annual fees based on emissions inventories. The methods used to calculate emissions for inventory purposes shall be based on the best available information accepted by AQD.

[OAC 252:100-5-2.1, OAC 252:100-5-2.2, and OAC 252:100-8-6(a)(8)]

SECTION VIII. TERM OF PERMIT

A. Unless specified otherwise, the term of an operating permit shall be five years from the date of issuance. [OAC 252:100-8-6(a)(2)(A)]

B. A source's right to operate shall terminate upon the expiration of its permit unless a timely and complete renewal application has been submitted at least 180 days before the date of expiration. [OAC 252:100-8-7.1(d)(1)]

C. A duly issued construction permit or authorization to construct or modify will terminate and become null and void (unless extended as provided in OAC 252:100-8-1.4(b)) if the construction is not commenced within 18 months after the date the permit or authorization was issued, or if work is suspended for more than 18 months after it is commenced. [OAC 252:100-8-1.4(a)]

D. The recipient of a construction permit shall apply for a permit to operate (or modified operating permit) within 180 days following the first day of operation. [OAC 252:100-8-4(b)(5)]

SECTION IX. SEVERABILITY

The provisions of this permit are severable and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

[OAC 252:100-8-6 (a)(6)]

SECTION X. PROPERTY RIGHTS

A. This permit does not convey any property rights of any sort, or any exclusive privilege.

[OAC 252:100-8-6(a)(7)(D)]

B. This permit shall not be considered in any manner affecting the title of the premises upon which the equipment is located and does not release the permittee from any liability for damage to persons or property caused by or resulting from the maintenance or operation of the equipment for which the permit is issued. [OAC 252:100-8-6(c)(6)]

SECTION XI. DUTY TO PROVIDE INFORMATION

A. The permittee shall furnish to the DEQ, upon receipt of a written request and within sixty (60) days of the request unless the DEQ specifies another time period, any information that the DEQ may request to determine whether cause exists for modifying, reopening, revoking,

reissuing, terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the DEQ copies of records required to be kept by the permit.

[OAC 252:100-8-6(a)(7)(E)]

B. The permittee may make a claim of confidentiality for any information or records submitted pursuant to 27A O.S. § 2-5-105(18). Confidential information shall be clearly labeled as such and shall be separable from the main body of the document such as in an attachment.

[OAC 252:100-8-6(a)(7)(E)]

C. Notification to the AQD of the sale or transfer of ownership of this facility is required and shall be made in writing within thirty (30) days after such sale or transfer.

[Oklahoma Clean Air Act, 27A O.S. § 2-5-112(G)]

SECTION XII. REOPENING, MODIFICATION & REVOCATION

A. The permit may be modified, revoked, reopened and reissued, or terminated for cause. Except as provided for minor permit modifications, the filing of a request by the permittee for a permit modification, revocation and reissuance, termination, notification of planned changes, or anticipated noncompliance does not stay any permit condition.

[OAC 252:100-8-6(a)(7)(C) and OAC 252:100-8-7.2(b)]

B. The DEQ will reopen and revise or revoke this permit prior to the expiration date in the following circumstances:

[OAC 252:100-8-7.3 and OAC 252:100-8-7.4(a)(2)]

- (1) Additional requirements under the Clean Air Act become applicable to a major source category three or more years prior to the expiration date of this permit. No such reopening is required if the effective date of the requirement is later than the expiration date of this permit.
- (2) The DEQ or the EPA determines that this permit contains a material mistake or that the permit must be revised or revoked to assure compliance with the applicable requirements.
- (3) The DEQ or the EPA determines that inaccurate information was used in establishing the emission standards, limitations, or other conditions of this permit. The DEQ may revoke and not reissue this permit if it determines that the permittee has submitted false or misleading information to the DEQ.
- (4) DEQ determines that the permit should be amended under the discretionary reopening provisions of OAC 252:100-8-7.3(b).

C. The permit may be reopened for cause by EPA, pursuant to the provisions of OAC 100-8-7.3(d).

[OAC 100-8-7.3(d)]

D. The permittee shall notify AQD before making changes other than those described in Section XVIII (Operational Flexibility), those qualifying for administrative permit amendments, or those defined as an Insignificant Activity (Section XVI) or Trivial Activity (Section XVII). The notification should include any changes which may alter the status of a "grandfathered source," as defined under AQD rules. Such changes may require a permit modification.

[OAC 252:100-8-7.2(b) and OAC 252:100-5-1.1]

E. Activities that will result in air emissions that exceed the trivial/insignificant levels and that are not specifically approved by this permit are prohibited. [OAC 252:100-8-6(c)(6)]

SECTION XIII. INSPECTION & ENTRY

A. Upon presentation of credentials and other documents as may be required by law, the permittee shall allow authorized regulatory officials to perform the following (subject to the permittee's right to seek confidential treatment pursuant to 27A O.S. Supp. 1998, § 2-5-105(18) for confidential information submitted to or obtained by the DEQ under this section):

- (1) enter upon the permittee's premises during reasonable/normal working hours where a source is located or emissions-related activity is conducted, or where records must be kept under the conditions of the permit;
- (2) have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit;
- (3) inspect, at reasonable times and using reasonable safety practices, any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit; and
- (4) as authorized by the Oklahoma Clean Air Act, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit.

[OAC 252:100-8-6(c)(2)]

SECTION XIV. EMERGENCIES

A. Any exceedance resulting from an emergency shall be reported to AQD promptly but no later than 4:30 p.m. on the next working day after the permittee first becomes aware of the exceedance. This notice shall contain a description of the emergency, the probable cause of the exceedance, any steps taken to mitigate emissions, and corrective actions taken.

[OAC 252:100-8-6 (a)(3)(C)(iii)(I) and (IV)]

B. Any exceedance that poses an imminent and substantial danger to public health, safety, or the environment shall be reported to AQD as soon as is practicable; but under no circumstance shall notification be more than 24 hours after the exceedance. [OAC 252:100-8-6(a)(3)(C)(iii)(II)]

C. An "emergency" means any situation arising from sudden and reasonably unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under this permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventive maintenance, careless or improper operation, or operator error. [OAC 252:100-8-2]

D. The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs or other relevant evidence that: [OAC 252:100-8-6 (e)(2)]

- (1) an emergency occurred and the permittee can identify the cause or causes of the emergency;
- (2) the permitted facility was at the time being properly operated;
- (3) during the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards or other requirements in this permit.

E. In any enforcement proceeding, the permittee seeking to establish the occurrence of an emergency shall have the burden of proof. [OAC 252:100-8-6(e)(3)]

F. Every written report or document submitted under this section shall be certified as required by Section III (Monitoring, Testing, Recordkeeping & Reporting), Paragraph F. [OAC 252:100-8-6(a)(3)(C)(iv)]

SECTION XV. RISK MANAGEMENT PLAN

The permittee, if subject to the provision of Section 112(r) of the Clean Air Act, shall develop and register with the appropriate agency a risk management plan by June 20, 1999, or the applicable effective date. [OAC 252:100-8-6(a)(4)]

SECTION XVI. INSIGNIFICANT ACTIVITIES

Except as otherwise prohibited or limited by this permit, the permittee is hereby authorized to operate individual emissions units that are either on the list in Appendix I to OAC Title 252, Chapter 100, or whose actual calendar year emissions do not exceed any of the limits below. Any activity to which a State or Federal applicable requirement applies is not insignificant even if it meets the criteria below or is included on the insignificant activities list.

- (1) 5 tons per year of any one criteria pollutant.
- (2) 2 tons per year for any one hazardous air pollutant (HAP) or 5 tons per year for an aggregate of two or more HAP's, or 20 percent of any threshold less than 10 tons per year for single HAP that the EPA may establish by rule.

[OAC 252:100-8-2 and OAC 252:100, Appendix I]

SECTION XVII. TRIVIAL ACTIVITIES

Except as otherwise prohibited or limited by this permit, the permittee is hereby authorized to operate any individual or combination of air emissions units that are considered inconsequential and are on the list in Appendix J. Any activity to which a State or Federal applicable requirement applies is not trivial even if included on the trivial activities list.

[OAC 252:100-8-2 and OAC 252:100, Appendix J]

SECTION XVIII. OPERATIONAL FLEXIBILITY

A. A facility may implement any operating scenario allowed for in its Part 70 permit without the need for any permit revision or any notification to the DEQ (unless specified otherwise in the

permit). When an operating scenario is changed, the permittee shall record in a log at the facility the scenario under which it is operating. [OAC 252:100-8-6(a)(10) and (f)(1)]

B. The permittee may make changes within the facility that:

- (1) result in no net emissions increases,
- (2) are not modifications under any provision of Title I of the federal Clean Air Act, and
- (3) do not cause any hourly or annual permitted emission rate of any existing emissions unit to be exceeded;

provided that the facility provides the EPA and the DEQ with written notification as required below in advance of the proposed changes, which shall be a minimum of seven (7) days, or twenty four (24) hours for emergencies as defined in OAC 252:100-8-6 (e). The permittee, the DEQ, and the EPA shall attach each such notice to their copy of the permit. For each such change, the written notification required above shall include a brief description of the change within the permitted facility, the date on which the change will occur, any change in emissions, and any permit term or condition that is no longer applicable as a result of the change. The permit shield provided by this permit does not apply to any change made pursuant to this paragraph. [OAC 252:100-8-6(f)(2)]

SECTION XIX. OTHER APPLICABLE & STATE-ONLY REQUIREMENTS

A. The following applicable requirements and state-only requirements apply to the facility unless elsewhere covered by a more restrictive requirement:

- (1) Open burning of refuse and other combustible material is prohibited except as authorized in the specific examples and under the conditions listed in the Open Burning Subchapter. [OAC 252:100-13]
- (2) No particulate emissions from any fuel-burning equipment with a rated heat input of 10 MMBTUH or less shall exceed 0.6 lb/MMBTU. [OAC 252:100-19]
- (3) For all emissions units not subject to an opacity limit promulgated under 40 C.F.R., Part 60, NSPS, no discharge of greater than 20% opacity is allowed except for: [OAC 252:100-25]
 - (a) Short-term occurrences which consist of not more than one six-minute period in any consecutive 60 minutes, not to exceed three such periods in any consecutive 24 hours. In no case shall the average of any six-minute period exceed 60% opacity;
 - (b) Smoke resulting from fires covered by the exceptions outlined in OAC 252:100-13-7;
 - (c) An emission, where the presence of uncombined water is the only reason for failure to meet the requirements of OAC 252:100-25-3(a); or
 - (d) Smoke generated due to a malfunction in a facility, when the source of the fuel producing the smoke is not under the direct and immediate control of the facility and the immediate constriction of the fuel flow at the facility would produce a hazard to life and/or property.

- (4) No visible fugitive dust emissions shall be discharged beyond the property line on which the emissions originate in such a manner as to damage or to interfere with the use of adjacent properties, or cause air quality standards to be exceeded, or interfere with the maintenance of air quality standards. [OAC 252:100-29]
- (5) No sulfur oxide emissions from new gas-fired fuel-burning equipment shall exceed 0.2 lb/MMBTU. No existing source shall exceed the listed ambient air standards for sulfur dioxide. [OAC 252:100-31]
- (6) Volatile Organic Compound (VOC) storage tanks built after December 28, 1974, and with a capacity of 400 gallons or more storing a liquid with a vapor pressure of 1.5 psia or greater under actual conditions shall be equipped with a permanent submerged fill pipe or with a vapor-recovery system. [OAC 252:100-37-15(b)]
- (7) All fuel-burning equipment shall at all times be properly operated and maintained in a manner that will minimize emissions of VOCs. [OAC 252:100-37-36]

SECTION XX. STRATOSPHERIC OZONE PROTECTION

A. The permittee shall comply with the following standards for production and consumption of ozone-depleting substances: [40 CFR 82, Subpart A]

- (1) Persons producing, importing, or placing an order for production or importation of certain class I and class II substances, HCFC-22, or HCFC-141b shall be subject to the requirements of §82.4;
- (2) Producers, importers, exporters, purchasers, and persons who transform or destroy certain class I and class II substances, HCFC-22, or HCFC-141b are subject to the recordkeeping requirements at §82.13; and
- (3) Class I substances (listed at Appendix A to Subpart A) include certain CFCs, Halons, HBFCs, carbon tetrachloride, trichloroethane (methyl chloroform), and bromomethane (Methyl Bromide). Class II substances (listed at Appendix B to Subpart A) include HCFCs.

B. If the permittee performs a service on motor (fleet) vehicles when this service involves an ozone-depleting substance refrigerant (or regulated substitute substance) in the motor vehicle air conditioner (MVAC), the permittee is subject to all applicable requirements. Note: The term “motor vehicle” as used in Subpart B does not include a vehicle in which final assembly of the vehicle has not been completed. The term “MVAC” as used in Subpart B does not include the air-tight sealed refrigeration system used as refrigerated cargo, or the system used on passenger buses using HCFC-22 refrigerant. [40 CFR 82, Subpart B]

C. The permittee shall comply with the following standards for recycling and emissions reduction except as provided for MVACs in Subpart B: [40 CFR 82, Subpart F]

- (1) Persons opening appliances for maintenance, service, repair, or disposal must comply with the required practices pursuant to § 82.156;
- (2) Equipment used during the maintenance, service, repair, or disposal of appliances must

- comply with the standards for recycling and recovery equipment pursuant to § 82.158;
- (3) Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program pursuant to § 82.161;
 - (4) Persons disposing of small appliances, MVACs, and MVAC-like appliances must comply with record-keeping requirements pursuant to § 82.166;
 - (5) Persons owning commercial or industrial process refrigeration equipment must comply with leak repair requirements pursuant to § 82.158; and
 - (6) Owners/operators of appliances normally containing 50 or more pounds of refrigerant must keep records of refrigerant purchased and added to such appliances pursuant to § 82.166.

SECTION XXI. TITLE V APPROVAL LANGUAGE

A. DEQ wishes to reduce the time and work associated with permit review and, wherever it is not inconsistent with Federal requirements, to provide for incorporation of requirements established through construction permitting into the Source's Title V permit without causing redundant review. Requirements from construction permits may be incorporated into the Title V permit through the administrative amendment process set forth in OAC 252:100-8-7.2(a) only if the following procedures are followed:

- (1) The construction permit goes out for a 30-day public notice and comment using the procedures set forth in 40 C.F.R. § 70.7(h)(1). This public notice shall include notice to the public that this permit is subject to EPA review, EPA objection, and petition to EPA, as provided by 40 C.F.R. § 70.8; that the requirements of the construction permit will be incorporated into the Title V permit through the administrative amendment process; that the public will not receive another opportunity to provide comments when the requirements are incorporated into the Title V permit; and that EPA review, EPA objection, and petitions to EPA will not be available to the public when requirements from the construction permit are incorporated into the Title V permit.
- (2) A copy of the construction permit application is sent to EPA, as provided by 40 CFR § 70.8(a)(1).
- (3) A copy of the draft construction permit is sent to any affected State, as provided by 40 C.F.R. § 70.8(b).
- (4) A copy of the proposed construction permit is sent to EPA for a 45-day review period as provided by 40 C.F.R. § 70.8(a) and (c).
- (5) The DEQ complies with 40 C.F.R. § 70.8(c) upon the written receipt within the 45-day comment period of any EPA objection to the construction permit. The DEQ shall not issue the permit until EPA's objections are resolved to the satisfaction of EPA.
- (6) The DEQ complies with 40 C.F.R. § 70.8(d).
- (7) A copy of the final construction permit is sent to EPA as provided by 40 CFR § 70.8(a).
- (8) The DEQ shall not issue the proposed construction permit until any affected State and EPA have had an opportunity to review the proposed permit, as provided by these permit conditions.
- (9) Any requirements of the construction permit may be reopened for cause after incorporation into the Title V permit by the administrative amendment process, by

DEQ as provided in OAC 252:100-8-7.3(a), (b), and (c), and by EPA as provided in 40 C.F.R. § 70.7(f) and (g).

- (10) The DEQ shall not issue the administrative permit amendment if performance tests fail to demonstrate that the source is operating in substantial compliance with all permit requirements.

B. To the extent that these conditions are not followed, the Title V permit must go through the Title V review process.

SECTION XXII. CREDIBLE EVIDENCE

For the purpose of submitting compliance certifications or establishing whether or not a person has violated or is in violation of any provision of the Oklahoma implementation plan, nothing shall preclude the use, including the exclusive use, of any credible evidence or information, relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed.

[OAC 252:100-43-6]

Mr. John Carver, Vice president – Safety and Environmental Compliance
Pryor Chemical Company
P.O. Box 429
Pryor, Oklahoma 74361

RE: Operating Permit No. **2008-100-C (M-1) (PSD)**
Pryor Chemical Company
Pryor Plant, Mid America Industrial Park
Pryor, Mayes County

Dear Mr. Carver:

Enclosed is the permit authorizing construction of the referenced facility. Please note that this permit is issued subject to standard and specific conditions, which are attached. These conditions must be carefully followed since they define the limits of the permit and will be confirmed by periodic inspections.

Also note that you are required to annually submit an emission inventory for this facility. An emission inventory must be completed on approved AQD forms and submitted (hardcopy or electronically) every year by April 1st. Any questions concerning the form or submittal process should be referred to the Emission Inventory Staff at 405-702-4100.

Thank you for your cooperation in this matter. If we may be of further service, please contact me at (918) 293-1617 or by mail at DEQ Regional Office at Tulsa, 3105 East Skelly Drive, Suite 200, Tulsa, Oklahoma, 74105.

Sincerely,

Phillip Fielder, P.E., Permits and Engineering Group Manager
AIR QUALITY DIVISION



PART 70 PERMIT

AIR QUALITY DIVISION
STATE OF OKLAHOMA
DEPARTMENT OF ENVIRONMENTAL QUALITY
707 N. ROBINSON, SUITE 4100
P.O. BOX 1677
OKLAHOMA CITY, OKLAHOMA 73101-1677

Permit No. 2008-100-C (M-1) (PSD)

Pryor Chemical Company,

having complied with the requirements of the law, is hereby granted permission to
construct the new burners in the Ammonia Plant #4 Primary Reformer and operate in
accordance with the approved 1-year trial BACT limit and to operate all the sources within
the boundaries of the Pryor Chemical Plant located in the Pryor – Mid America Industrial
Park, Section 3, Township 20 N, Range 19 E, Mayes County, Oklahoma,

subject to standard conditions dated July 21, 2009 and specific conditions, both attached.

Except as authorized under Section VIII of the Standard Conditions, this permit shall expire 14 months from the issuance date. This includes the 1-year trial BACT analysis and the 60-day submittal deadline for the operating application.

Director, Air Quality Division

Date